PATENT ROOM

Vol. 1125 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

April 2, 1991

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

April 2, 1991 Volume 1125 Number 1

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1125 OG 2
Status of Appeal Cases	1125 OG 2
Notice of Maintenance Fees Payable	1125 OG 2
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1125 OG 3
Notification of Acceptance of Delayed Payment of Maintenance Fee	1125 OG 5
Reissue Applications Filed	1125 OG 6
Requests for Reexaminations Filed	1125 OG 6
Errata	1125 OG 7
Notice of Adverse Decision in Interference	1125 OG 7
Patent Certificates of Correction	1125 OG 8
Special Boxes for Mail	1125 OG 9
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1125 OG 10
Patent Examining Corps	1125 OG 12
Official Gazette Notice	1125 OG 13
Reexaminations	1
Statutory Invention Registrations	5
Reissue Patents Granted (33,562)	9
Plant Patents Granted (7,484)	11
Patents Granted	
General and Mechanical (5,003,630)	13
Chemical (5,004,478)	307
Electrical (5,004,865)	419
Design Patents Granted (315,823)	541
Index of Patentees	PI 1
Indices of Reissue, Reexamination, Design, Plant and Statutory Invention Registrations	PI 62
Classification of	
Patents (Including Reissues and Reexaminations)	PI 69
Designs, and Plants Applications	PI 72
Geographical Index of Residence of Inventors	
Patents (Including Reissues and Reexaminations)	PI 73
Designs and Plant Applications	PI 75
Change of Address Form and Subscription Order Form	PI 77

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed.

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $10.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1118 O.G. 54 on Nov. 27, 1990.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of Jan. 3, 1991, and was announced in the *Official Gazette* at 1122 O.G. 564 on Jan. 1, 1991.

International PCT fees were changed on March 1, 1991 due to a difference in the exchange rate of the U.S. dollar in relation to the Swiss Franc and were announced in the *Official Gazette* at 1122 O.G. 629S on Jan. 22, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1492.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	559.00
Basic Supplemental fee (for each page over 30)	11.00
Designation fee per country or region for the first 10 national or regional offices	135.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	171.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Dec. 21, 1990 HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Status of Appeal Cases

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Assignment to Panel For A Decision Without a Hearing as of February 28, 1991.

Chemical Discipline -	April 2, 1990
Mechanical Discipline -	January 2, 1990
Electrical Discipline -	April 10, 1990

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting the Setting of Hearing Date as of February 28, 1991.

Chemical -	April 2, 1990
Electrical -	No cases awaiting to be set for Hearing
Mechanical -	No cases awaiting to be set for Hearing

Board of Patent Appeals and Interferences Decisions Rendered in Ex Parte Appeals During the Month of February 1991.

Affirmed	194
Affirmed-in-Part	42
Reversed	128
Total Decided	364

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth

in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on March 29, 1988 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,733,410 through 4,734,937
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on March 27, 1984 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,438,531 through 4,439,870
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e) and (f), as amended Nov. 5, 1990, which are reproduced below:

37 CFR § 1.20 Post-issuance fees and surcharges

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant $245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant ..... $495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) $415.00
By other than a small entity ..... $850.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)) $835.00
By other than a small enttity ..... $1670.00"

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(k), (l) and (m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 ..... $120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)) $60.00
By other than a small entity ..... $120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable ..... $550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JANUARY 20, 1991 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,368,563	06/282,697	1/18/83
4,368,581	06/256,737	1/18/83
4,368,585	06/269,747	1/18/83
4,368,604	06/250,218	1/18/83
4,368,607	06/274,253	1/18/82
4,368,609	06/236,396	1/18/83
4,368,611	06/247,021	1/18/83
4,368,614	06/245,393	1/18/83
4,368,632	06/228,991	1/18/83
4,368,640	06/229,424	1/18/83
4,368,654	06/237,512	1/18/83
4,368,663	06/241,679	1/18/83
4,368,668	06/264,667	1/18/83
4,368,678	06/216,438	1/18/83
4,368,685	06/327,789	1/18/83
4,368,691	06/240,556	1/18/83
4,368,694	06/265,879	1/18/83
4,368,695	06/265,805	1/18/83
4,368,701	06/233,958	1/18/83
4,368,711	06/339,618	1/18/83
4,368,715	06/221,769	1/18/83
4,368,720	06/273,717	1/18/83
4,368,723	06/242,316	1/18/83
4,368,730	06/233,696	1/18/83
4,368,767	06/223,859	1/18/83
4,368,790	06/229,089	1/18/83
4,368,823	06/239,178	1/18/83
4,368,845	06/239,325	1/18/83
4,368,874	06/310,134	1/18/83
4,368,876	06/259,059	1/18/83
4,368,878	06/231,725	1/18/83
4,368,882	06/218,092	1/18/83
4,368,886	06/283,005	1/18/83
4,368,889	06/281,127	1/18/83
4,368,890	06/252,590	1/18/83
4,368,891	06/339,375	1/18/83
4,368,897	06/223,907	1/18/83
4,368,914	06/224,324	1/18/83
4,368,918	06/217,502	1/18/83
4,368,923	06/234,463	1/18/83
4,368,925	06/240,506	1/18/83
4,368,936	06/308,108	1/18/83
4,368,962	06/229,667	1/18/83
4,368,967	06/279,490	1/18/83
4,368,974	06/258,369	1/18/83
4,368,985	06/224,670	1/18/83
4,369,017	06/266,353	1/18/83
4,369,032	06/251,372	1/18/83
4,369,034	06/253,649	1/18/83
4,369,041	06/263,031	1/18/83
4,369,044	06/246,714	1/18/83
4,369,050	06/245,332	1/18/83
4,369,066	06/342,168	1/18/83
4,369,074	06/278,482	1/18/83
4,369,080	06/240,797	1/18/83

Patent Number	Serial Number	Issue Date
4,369,082	06/277,696	1/18/83
4,369,088	06/318,857	1/18/83
4,369,095	06/258,726	1/18/83
4,369,101	06/258,576	1/18/83
4,369,107	06/275,497	1/18/83
4,369,143	06/287,591	1/18/83
4,369,145	06/216,914	1/18/83
4,369,146	06/261,516	1/18/83
4,369,147	06/324,492	1/18/83
4,369,162	06/298,630	1/18/83
4,369,163	06/317,931	1/18/83
4,369,164	06/327,744	1/18/83
4,369,171	06/241,435	1/18/83
4,369,181	06/290,223	1/18/83
4,369,183	06/230,205	1/18/83
4,369,197	06/229,176	1/18/83
4,369,201	06/239,487	1/18/83
4,369,203	06/273,312	1/18/83
4,369,211	06/228,698	1/18/83
4,369,215	06/328,230	1/18/83
4,369,241	06/232,707	1/18/83
4,369,248	06/265,658	1/18/83
4,369,255	06/287,007	1/18/83
4,369,263	06/216,586	1/18/83
4,369,271	06/244,362	1/18/83
4,369,277	06/276,301	1/18/83
4,369,291	06/289,389	1/18/83
4,369,296	06/243,877	1/18/83
4,369,302	06/221,282	1/18/83
4,369,309	06/240,219	1/18/83
4,369,314	06/322,951	1/18/83
4,369,315	06/323,113	1/18/83
4,369,349	06/252,091	1/18/83
4,369,363	06/244,417	1/18/83
4,369,377	06/345,766	1/18/83
4,369,389	06/258,378	1/18/83
4,369,394	06/220,276	1/18/83
4,369,408	06/226,043	1/18/83
4,369,419	06/298,834	1/18/83
4,369,436	06/259,661	1/18/83
4,369,439	06/225,123	1/18/83
4,369,449	06/268,846	1/18/83
4,369,467	06/225,996	1/18/83
4,369,475	06/253,316	1/18/83
4,369,480	06/248,198	1/18/83
4,369,486	06/256,840	1/18/83
4,637,075	06/849,013	1/20/87
4,637,076	06/755,340	1/20/87
4,637,077	06/837,349	1/20/87
4,637,079	06/732,412	1/20/87
4,637,082	06/716,155	1/20/87
4,637,086	06/690,774	1/20/87
4,637,089	06/751,021	1/20/87
4,637,113	06/608,451	1/20/87
4,637,114	06/747,323	1/20/87
4,637,116	06/796,061	1/20/87
4,637,120	06/708,997	1/20/87
4,637,139	06/679,507	1/20/87
4,637,145	06/554,861	1/20/87
4,637,148	06/752,618	1/20/87
4,637,158	06/850,831	1/20/87
4,637,159	06/792,058	1/20/87
4,637,160	06/868,005	1/20/87
4,637,162	06/824,881	1/20/87
4,637,164	06/831,709	1/20/87
4,637,170	06/692,234	1/20/87
4,637,172	06/677,464	1/20/87
4,637,175	06/509,600	1/20/87
4,637,185	06/621,957	1/20/87
4,637,188	06/834,725	1/20/87
4,637,196	06/646,994	1/20/87
4,637,197	06/814,572	1/20/87
4,637,215	06/768,735	1/20/87
4,637,217	06/757,157	1/20/87
4,637,219	06/854,910	1/20/87
4,637,221	06/735,682	1/20/87
4,637,226	06/765,639	1/20/87
4,637,235	06/680,095	1/20/87
4,637,244	06/634,098	1/20/87
4,637,257	06/798,564	1/20/87
4,637,260	06/895,589	1/20/87
4,637,261	06/802,435	1/20/87
4,637,263	06/768,392	1/20/87
4,637,277	06/660,398	1/20/87
4,637,279	06/840,542	1/20/87
4,637,286	06/794,365	1/20/87
4,637,297	06/732,945	1/20/87
4,637,306	06/734,591	1/20/87
4,637,309	06/766,191	1/20/87
4,637,322	06/703,582	1/20/87
4,637,325	06/763,545	1/20/87
4,637,327	06/821,244	1/20/87
4,637,328	06/634,278	1/20/86
4,637,332	06/769,828	1/20/87
4,637,334	06/755,751	1/20/87
4,637,337	06/677,087	1/20/87
4,637,363	06/706,449	1/20/87
4,637,371	06/669,230	1/20/87
4,637,372	06/302,039	1/20/87
4,637,376	06/752,923	1/20/87
4,637,383	06/812,499	1/20/87
4,637,387	06/498,932	1/20/87
4,637,389	06/721,168	1/20/87
4,637,391	06/847,693	1/20/87
4,637,404	06/543,866	1/20/87
4,637,415	06/690,883	1/20/87
4,637,416	06/666,250	1/20/87
4,637,418	06/664,470	1/20/87
4,637,422	06/819,257	1/20/87
4,637,423	06/780,963	1/20/87
4,637,424	06/738,015	1/20/87
4,637,435	06/763,561	1/20/87
4,637,440	06/727,243	1/20/87
4,637,441	06/763,308	1/20/87
4,637,442	06/767,398	1/20/87
4,637,444	06/671,112	1/20/87
4,637,446	06/678,582	1/20/87
4,637,455	06/656,052	1/20/87
4,637,462	06/740,986	1/20/87
4,637,468	06/771,588	1/20/87
4,637,471	06/729,110	1/20/87
4,637,476	06/720,285	1/20/87
4,637,480	06/773,728	1/20/87
4,637,484	06/725,422	1/20/87
4,637,487	06/771,774	1/20/87
4,637,490	06/785,539	1/20/87
4,637,492	06/814,557	1/20/87
4,637,497	06/828,785	1/20/87
4,637,505	06/750,747	1/20/87
4,637,506	06/616,277	1/20/87
4,637,516	06/672,482	1/20/87
4,637,517	06/648,491	1/20/87
4,637,521	06/754,340	1/20/87
4,637,523	06/669,470	1/20/87
4,637,524	06/730,497	1/20/87
4,637,525	06/600,004	1/20/87
4,637,528	06/572,292	1/20/87
4,637,529	06/553,141	1/20/87
4,637,538	06/764,590	1/20/87
4,637,539	06/648,988	1/20/87
4,637,546	06/776,575	1/20/87
4,637,551	06/720.087	1/20/87
4,637,577	06/858,839	1/20/87
4,637,582	06/818,218	1/20/87
4,637,583	06/687,593	1/20/87
4,637,601	06/616,147	1/20/87
4,637,614	06/788,967	1/20/87
4,637,616	06/786,069	1/20/87
4,637,622	06/667,620	1/20/87
4,637,626	06/667,331	1/20/87
4,637,627	06/580,896	1/20/87
4,637,631	06/664,021	1/20/87
4,637,641	06/741,680	1/20/87
4,637,643	06/794,028	1/20/87

Patent Number	Serial Number	Issue Date
4,637,645	06/744,813	1/20/87
4,637,647	06/833,354	1/20/87
4,637,650	06/686,233	1/20/87
4,637,652	06/772,138	1/20/87
4,637,654	06/702,654	1/20/87
4,637,658	06/761,852	1/20/87
4,637,659	06/661,305	1/20/87
4,637,699	06/650,329	1/20/87
4,637,713	06/781,227	1/20/87
4,637,724	06/562,656	1/20/87
4,637,726	06/699,282	1/20/87
4,637,731	06/700,701	1/20/87
4,637,732	06/557,909	1/20/87
4,637,733	06/734,195	1/20/87
4,637,746	06/260,940	1/20/87
4,637,756	06/694,021	1/20/87
4,637,768	06/504,686	1/20/87
4,637,773	06/691,301	1/20/87
4,637,777	06/671,256	1/20/87
4,637,785	06/733,764	1/20/87
4,637,805	06/681,871	1/20/87
4,637,809	06/799,615	1/20/87
4,637,816	06/682,001	1/20/87
4,637,824	06/747,499	1/20/87
4,637,827	06/805,153	1/20/87
4,637,838	06/708,463	1/20/87
4,637,856	06/808,073	1/20/87
4,637,858	06/705,156	1/20/87
4,637,862	06/809,436	1/20/87
4,637,867	06/311,288	1/20/87
4,637,869	06/814,837	1/20/87
4,637,874	06/764,475	1/20/87
4,637,883	06/848,559	1/20/87
4,637,892	06/826,011	1/20/87
4,637,894	06/706,511	1/20/87
4,637,901	06/786,721	1/20/87
4,637,902	06/589,289	1/20/87
4,637,905	06/722,102	1/20/87
4,637,908	06/774,050	1/20/87
4,637,916	06/571,765	1/20/87
4,637,930	06/696,698	1/20/87
4,637,931	06/658,945	1/20/87
4,637,934	06/599,426	1/20/87
4,637,941	06/693,104	1/20/87
4,637,944	06/713,477	1/20/87
4,637,957	06/852,380	1/20/87
4,637,965	06/800,872	1/20/87
4,637,970	06/684,755	1/20/87
4,637,974	06/691,352	1/20/87
4,637,985	06/536,238	1/20/87
4,638,001	06/604,813	1/20/87
4,638,004	06/734,503	1/20/87
4,638,013	06/674,853	1/20/87
4,638,019	06/585,250	1/20/87
4,638,026	06/662,517	1/20/87
4,638,048	06/828,608	1/20/87
4,638,053	06/775,111	1/20/87
4,638,054	06/662,334	1/20/87
4,638,059	06/625,548	1/20/87
4,638,066	06/684,080	1/20/87
4,638,080	06/832,690	1/20/87
4,638,081	06/608,983	1/20/87
4,638,085	06/660,978	1/20/87
4,638,088	06/672,007	1/20/87
4,638,113	06/752,408	1/20/87
4,638,123	06/590,658	1/20/87
4,638,127	06/772,686	1/20/87
4,638,129	06/681,668	1/20/87
4,638,130	06/662,089	1/20/87
4,638,142	06/785,699	1/20/87
4,638,146	06/785,588	1/20/87
4,638,147	06/661,903	1/20/87
4,638,169	06/654,460	1/20/87
4,638,176	06/761,471	1/20/87
4,638,177	06/798,259	1/20/87
4,638,193	06/674,185	1/20/87
4,638,207	06/841,137	1/20/87
4,638,221	06/796,117	1/20/87
4,638,238	06/787,283	1/20/87
4,638,244	06/663,644	1/20/87
4,638,248	06/743,165	1/20/87
4,638,249	06/340,254	1/20/87
4,638,264	06/814,187	1/20/87
4,638,272	06/692,885	1/20/87
4,638,281	06/718,637	1/20/87
4,638,286	06/716,183	1/20/87
4,638,293	06/642,431	1/20/87
4,638,297	06/642,442	1/28/87
4,638,349	06/649,872	1/20/87
4,638,354	06/703,710	1/20/87
4,638,378	06/743,778	1/20/87
4,638,387	06/558,328	1/20/87
4,638,389	06/816,717	1/20/87
4,638,391	06/619,034	1/20/87
4,638,405	06/809,473	1/20/87
4,638,408	06/625,833	1/20/87
4,638,409	06/796,165	1/20/87
4,638,413	06/671,677	1/20/87
4,638,422	06/611,981	1/20/87
4,638,441	06/615,730	1/20/87
4,638,448	06/531,754	1/20/87
4,638,454	06/446,458	1/20/87
4,638,469	06/611,976	1/20/87
4,638,474	06/682,038	1/20/87
4,638,478	06/747,722	1/20/87
4,638,480	06/721,770	1/20/87
4,638,486	06/717,106	1/20/87

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
(4,413,619)	(06/311,959)	(11/08/83)	(10/16/81)	
Re. 32,219	06/578,979	8/05/86	2/10/84	2/22/91
4,328,617	06/262,644	5/11/82	5/11/81	2/15/91
4,361,405	06/217,591	11/30/82	12/18/80	1/31/91
4,566,093	06/582,034	12/03/85	2/21/84	1/22/91
4,574,025	06/566,582	3/04/86	12/29/83	1/31/91
4,554,446	06/552,916	11/19/85	11/18/83	2/15/91
4,584,569	06/650,835	4/22/86	9/17/84	2/22/91
4,583,329	06/699,199	4/22/86	2/07/85	2/25/91

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b).

4,064,376, Re. S. N. 07/526,540, Filed May 21, 1990, Cl. 381/152, SOUND REPRODUCTION SYSTEM AND DEVICE, Kyoto Yamada, Owner of Record: *Bodysonic Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: James M. Verna, Ex. Gp.: 235

4,451,205, Re. S. N. 07/656,337, Filed Dec. 24, 1990, Cl. 416/219R, HELICOPTER BLADE AIR FOIL, Keith T. Honda, et al., Owner of Record: *United Technologies Corp., Hartford, Conn.*, Attorney or Agent: Marshall E. Rosenberg, Ex. Gp.: 341

4,638,519, Re. S. N. 07/301,076, Filed Jan. 24, 1989, Cl. 005/455, FLUIDIZED HOSPITAL BED, Jack H. Hess, Owner of Record: *Dynatronics, Inc., Houston, Tex.*, Attorney or Agent: None, Ex. Gp.: 358

4,658,691, Re. S. N. 07/641,604, Filed Jan. 15, 1991, Cl. 84/1.19, ELECTRONIC MUSICAL INSTRUMENT, Masanori Ishibashi, et al., Owner of Record: *Casio Computer Co., Ltd., Tokyo, Japan*, Attorney or Agent: Thomas Langer, Ex. Gp.: 211

4,699,323, Re. S. N. 07/623,393, Filed Feb. 6, 1991, Cl. 239, DUEL SPRAY CONE ELECTROMAGNETIC FUEL INJECTOR, James H. Rush, Owner of Record: *General Motors Corp., Detroit, Mich.*, Attorney or Agent: Charles K. Veenstra, Ex. Gp.: 314

4,740,577, Re. S. N. 07/655,573, Filed Feb. 13, 1991, Cl. 528/51, ENERGY POLYMERIZABLE POLYURETHANE PRECURSORS, Robert J. DeVoe, et al., Owner of Record: *Ciba-Geigy Corp., Hawthorne, N.Y.*, Attorney or Agent: Harry Falber, Ex. Gp.: 153

4,747,198, Re. S. N. 07/658,788, Filed Feb. 21, 1991, Cl. 29/407, METHOD AND APPARATUS FOR DECTECTING HOLD-POSITION OF ELECTRONIC COMPONENT, AND APPARATUS FOR MOUNTING ELECTRONIC COMPONENT, Koichi Asai, et al., Owner of Record: *Fugi Machine Mfg. Co., Ltd., Chiru-Shi, Japan*, Attorney or Agent: James A. Oliff, Ex. Gp.: 326

4,757,503, Re. S. N. 07/551,477, Filed July 12, 1990, Cl. 371/21.1, SELF-TESTING DYNAMIC RAM, John P. Hayes, et al., Owner of Record: *The University of Michigan, Ann Arbor, Mich.*, Attorney or Agent: Vincent P. Kovalick, Ex. Gp.: 236

4,765,323, Re. S. N. 07/658,170, Filed Feb. 20, 1991, Cl. 128/132, REFLECTIVE SURGICAL DRAPE, Robert J. Poettgen, Owner of Record: *OR Concepts, Inc., Roanoke, Tex.*, Attorney or Agent: Randall C. Brown, Ex. Gp.: 331

4,785,455, Re. S. N. 07/615,827, Filed Nov. 15, 1990, Cl. 372/46, LIGHT EMITTING DEVICE WITH IMPROVED ELECTRODE STRUCTURE TO MINIMIZE SHORT CIRCUITING, Masaaki Sawai, et al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan*, Attorney or Agent: Gregory E. Montone, Ex. Gp.: 251

4,787,996, Re. S. N. 07/620,494, Filed Nov. 29, 1990, Cl. 252/51.5R, MANNICH BASE OIL ADDITIVES, Andrew G. Horodysky, Owner of Record: *Mobile Oil Corp., New York, N.Y.*, Attorney or Agent: Michael J. Mlotkowski, Ex. Gp.: 119

4,803,540, Re. S. N. 07/653,362, Filed Feb. 6, 1991, Cl. 357/70, SEMICONDUCTOR INTEGRATED CIRCUIT PACKAGES, H. W. Moyer, et al., Owner of Record: *American Telephone & Telegraph Co., New York, N.Y.*, Attorney or Agent: Richard D. Laumann, Ex. Gp.: 258

4,840,616, Re. S. N. 07/652,703, Filed Feb. 8, 1991, Cl. 604/110, SYRINGE HYPODERMIC NEEDLE, Gilbert H. Banks, Owner of Record: *Tranbrook PTY Ltd, Sydney, Australia*, Attorney or Agent: James F. Hann, Ex. Gp.: 331

4,848,459, Re. S. N. 07/591,510, Filed Oct. 1, 1990, Cl. 166/142, APPARATUS FOR INSTALLING A LINER WITH A WELL BORE, Henry W. Blackwell, et al., Owner of Record: *Conoco, Inc., Ponca City, Okla.*, Attorney or Agent: Roy L. Vanwinkle, Ex. Gp.: 356

4,923,442, Re. S. N. 07/602,096, Filed Oct. 23, 1990, Cl. 604/52, BLOOD SUBSTITUTE, Paul E. Segall, et al., Owner of Record: *Cryomedical Sciences, Inc., Berkeley, Calif.*, Attorney or Agent: Elliott L. Fineman, Ex. Gp.: 336

4,945,924, Re. S. N. 07/658,486, Filed Feb. 20, 1991, Cl. 128/849, STERILIZABLE REFLECTIVE SURGICAL DRAPE, Robert J. Poettgen, Owner of Record: *OR Concepts, Inc., Roanoke, Tex.*, Attorney or Agent: Randall C. Brown, Ex. Gp.: 331

4,950,087, Re. S. N. 07/656,516, Filed Feb. 19, 1991, Cl. 383/43, BAG FOR OBJECTS SUCH AS SNACKS, Robert J. Carey, Owner of Record: *Inventor*, Attorney or Agent: R. Gale Rhodes, Ex. Gp.: 241

4,952,074, Re. S. N. 07/654,668, Filed Feb. 13, 1991, Cl. 384/19, PULL-OUT GUIDE FOR DRAWERS, Erich Rock, Owner of Record: *Julius Blum Gesellschaft M.B.H., Hochst, Austria*, Attorney or Agent: Jeffrey Nolton, Ex. Gp.: 245

4,946,186, Re. S. N. 07/655,148, Filed Feb. 14, 1991, Cl. 280/646, TELESCOPIC AND COLLAPSIBLE GOLF CART, Alex Cheng, Owner of Record: *Union Sports Co., Ltd., Taipei*, Attorney or Agent: Philip Furgang, Ex. Gp.: 316

4,957,993, Re. S. N. 07/655,888, Filed Feb. 15, 1991, Cl. 528/26, NOVEL POLYMIDESILOXANES AND METHODS FOR THEIR PREPARATION AND USE, Chung J. Lee, Owner of Record: *Occidental Chemical Corp., Niagara Falls, N.Y.*, Attorney or Agent: Richard D. Fuerle, Ex. Gp.: 151

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

Re. 31,852, Reexam. No. 90/002,284, Requested Feb. 20, 1991, Cl. 370/85.15, DATA TRANSMISSION SYSTEM, Olof Soderblom, Owner of Record: *Inventor, Leitherhead, United Kingdom*, Attorney or Agent: Pollock, Vande Sande & Priddy, Ex. Gp.: 260, Requester: W.M. Harding, Houston, Tex.

4,410,917, Reexam. No. 90/002,283, Requested Feb. 20, 1991, Cl. 360/15, METHOD AND APPARATUS FOR RECORDING INFORMATION FROM A MASTER MEDIUM ONTO A SLAVE MEDIUM EMPLOYING DIGITAL TECHNIQUES, Ronald M. Newdoll, Owner of Record: *Accurate Sound Corp., Redwood City, Calif.*, Attorney or Agent: Bell, Seltzer, Park & Gibson, Ex. Gp.: 230, Requester: W.T. Adams, Charlotte, N.C.

4,673,477, Reexam. No. 90/002,285, Requested Feb. 19, 1991, Cl. 204/192.38, CONTROLLED VACUUM ARC MATERIAL DEPOSITION METHOD AND APPARATUS, Subbiah Ramalingam, et al., Owner of Record: *Regents of the University of Minnesota, Minneapolis, Minn.*, Attorney or Agent: N.E. Westman, Ex. Gp.: 110, Requester: Multi-Arc Oberflachentechnik, Fed. Rep. of Germany

4,801,609, Reexam. No. 90/002,282, Requested Feb. 14, 1991, Cl. 514/506, MERCAPTO-ACYLAMINO ACID ANTIHYPERTENSIVES, Martin F. Haslanger, et al., Owner of Record: *Schering Corp., Kenilworth, N.J.*, Attorney or Agent: Schering-Plough Corp., Ex. Gp.: 120, Requester: Owner

4,963,344, Reexam. No. 90/002,281, Requested Feb. 14, 1991, Cl. 424/9, METHOD TO ENHANCE NMR IMAGING USING CHELATED PARAMAGNETIC IONS, Heinz Gries, et al., Owner of Record: *Schering Aktiengesellschaft, Berlin, Fed. Rep. of Germany*, Attorney or Agent: Anthony J. Zelano, Ex. Gp.: 120, Requester: Owner

---

Errata

In the list of patents which expired on Dec. 16, 1990, due to failure to pay maintenance fees, appearing in the O.G. of Feb. 26, 1991, the following patent should not have appeared:

Patent Number	Serial Number	Issue Date	Filing Date
4,628,827	06/605,232	12/16/86	4/30/84

"All reference to Reexamination Certificate No. B1. 4,729,706(1351st) appearing in the Official Gazette of Sept. 11, 1990 should be deleted since no reexamination certificate was granted."

"All reference to Patent No. 4,983,229 to Thomas W. Tull of Mich. for 'COLD DEFORMATION PROCESS EMPLOYING IMPROVED LUBRICATION COATING' appearing in the Official Gazette of Jan. 8, 1991 should be deleted since no patent was granted.

"All reference to Patent No. 4,990,257 to Atsuo Watanabe of Japan for 'CONCENTRATION OF SOLUTION REVERSE OSMOSIS PROCESS' appearing in the Official Gazette of Feb. 5, 1991 should be deleted since no patent was granted."

"All reference to Patent No. 4,995,841 to Donald R. Coffey of Ariz. for 'WATER SKIER'S SAFTEY SYSTEM' appearing in the Official Gazette of Feb. 26, 1991 should be deleted since no patent was granted."

"All reference to Patent No. 4,996,338 to Hiroshi Maezawa et al. of Ichihara, Japan for 'PROCESS FOR PREPARATION OF ALUMINOXANE' appearing in the Official Gazette of Feb. 26, 1991 should be deleted since no patent was granted."

ADVERSE DECISION IN INTERFERENCE

Patent No. 4,725,129, K. Kondo and Y. Nagae, METHOD OF DRIVING A FERROELECTRIC LIQUID CRYSTAL ELEMENT, Interference No. 102,090, decided Nov. 16, 1990, claims 1-10.

PATENT NOTICES

Certificates of Correction For Week of April 2, 1991

PP. 6,989	4,860,158	4,888,639	4,904,547
Re. 33,153	4,861,549	4,889,001	4,905,659
Re. 33,168	4,861,694	4,889,006	4,905,723
4,500,484	4,863,707	4,889,569	4,906,020
4,710,968	4,865,206	4,890,585	4,906,085
4,743,669	4,865,418	4,891,454	4,906,395
4,761,409	4,865,553	4,891,809	4,906,530
4,767,600	4,866,774	4,892,025	4,906,611
4,771,950	4,868,094	4,892,617	4,906,709
4,793,793	4,869,055	4,892,625	4,906,713
4,794,625	4,869,841	4,892,781	4,906,870
4,795,678	4,870,098	4,892,823	4,906,925
4,805,253	4,870,209	4,893,033	4,907,003
4,808,717	4,870,808	4,893,044	4,907,986
4,810,576	4,872,329	4,893,431	4,908,263
4,810,911	4,872,684	4,893,546	4,908,698
4,812,689	4,874,792	4,894,504	4,908,734
4,818,740	4,874,929	4,894,538	4,909,288
4,821,972	4,875,109	4,895,068	4,909,361
4,826,476	4,875,891	4,895,790	4,909,518
4,830,910	4,876,432	4,896,180	4,909,639
4,834,522	4,876,746	4,896,238	4,910,378
4,837,663	4,877,392	4,896,309	4,910,718
4,838,181	4,877,526	4,897,102	4,911,027
4,838,352	4,880,262	4,897,307	4,911,377
4,839,743	4,880,816	4,897,833	4,912,003
4,840,407	4,881,608	4,898,424	4,912,234
4,842,434	4,883,566	4,898,726	4,913,976
4,843,056	4,884,025	4,898,774	4,914,296
4,843,990	4,885,541	4,898,784	4,914,603
4,845,496	4,885,721	4,899,115	4,916,060
4,849,569	4,886,426	4,900,327	4,917,785
4,852,090	4,886,488	4,901,738	4,918,200
4,853,141	4,886,809	4,902,539	4,948,572
4,853,529	4,886,811	4,902,560	4,948,694
4,855,269	4,887,160	4,902,586	4,950,877
4,855,962	4,887,608	4,902,898	4,957,738
4,858,630	4,887,888	4,903,516	4,962,287
4,859,036	4,888,415	4,904,359	

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

The following special boxes should be used only for their specified purpose. Address mail as follows:

Box _____
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box 3	Mail for the Office of personel for NFC
Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislation and Internal Affairs.
Box 5	"No Fee" mail related to trademarks.
Box 6	Mail for the Office of Procurement
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation*; papers relating to pending litigation shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Va. 22215
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of patent and trademark applications.
Box 11	Electronic Ordering Service (EOS).
Box 12	Contributions to the Examiner Education Program.
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Invoices directed to the Office of Finance.
Box 15	Mail for the Advisory Commission on Patent Law Reform.
Box 171	Vacancy Announcement Applications.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Equal Employment Programs.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62)
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All Communications following the receipt of a PTOL-85. "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box ITU	All intent to use documents, excluding the initial application and amendments to allege use.
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Non-Fee-Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box OED	Mail for the Office of Enrollment and Discipline
Box PATENT APPLICATION	New patent application and associated papers and fees.
Box TRADEMARK	New trademark application and associated papers and APPLICATION fees.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to libary, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions*, and provides technical staff assistance in their uae to aid the public, in gaining effective access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage: Z. J. Loussac Public Library	(907) 261-2916
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 640-8847
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa: Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 689-3155
Kentucky	Louisville Free Public Library	(502) 561-8617
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	Not Yet Operational
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada-Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(201) 932-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 473-4636
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 737-3280
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 744-7086
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861

Reference Collections of U. S. Patents Available for Public Use in Patent Depository Libraries—(continued)

State	*Name of Library*	*Telephone Contact*
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Stevenson Science Library,Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext.2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director.	308-0661
ORGANIC CHEMISTRY GROUP 120—JOHN F. TERAPANE, JR., Director	308-1235
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP— 130 BARRY S. RICHMAN, Director	308-0651
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	308-2351
BIOTECHNOLOGY, GROUP 180—EDWARD E. KUBASIEWICZ, Director	308-0196
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. KELLY, Director	308-1782
SPECIAL LAWS ADMINISTRATION, GROUP 220—ROBERT E. GARRETT, Director	308-0511
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—GERALD GOLDBERG, Director	308-0754
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—CARLTON CROYLE Director	308-0771
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—JOSEPH J. ROLLA, Director.	308-0956
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP— 260 STEWART LEVY, Acting Director	308-0962
DESIGN, GROUP 290—ROBERT E. GARRETT, Director	308-0511
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	308-1113
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Director	308-1148
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	308-0858
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—JOHN KITTLE, Director	308-0861
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350— A. L. SMITH, Director	308-0651

Expiration of patents: The patents within the range of numbers indicated below expire during March 1991 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,795,014 to 3,800,328 inclusive
Plant Patents ..... 3,501 to 3,534 inclusive

OFFICIAL GAZETTE NOTICE

The Trademark Search Library and the trademark portion of the Assignment Search Room will be relocated to the second floor of 2900 Crystal Drive (South Tower Building) in Arlington, Virginia, effective April 8, 1991. In order to facilitate an orderly move, the Trademark Search Library will close to the public on Thursday, April 4 at 5:30 p.m. and will not reopen until Monday, April 8, 1991, at 8:00 a.m. at the new location. The Assignment Search Room will maintain normal business hours from 8:30 a.m. to 5:00 p.m. on Friday, April 5, 1991.

The Trademark Search Library and Trademark Assignment Search Room hours will be 8:00 a.m. to 5:30 p.m., Monday to Friday, at the South Tower location.

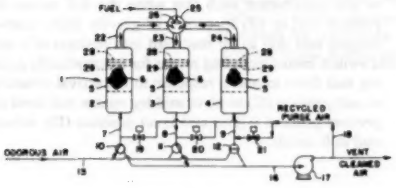
Theresa A. Brelsford
Assistant Commissioner
for Administration

REEXAMINATIONS

APRIL 2, 1991

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,870,474 (1441st)
REGENERATIVE INCINERATOR SYSTEMS FOR WASTE GASES
Reagan Houston, Avon Lake, Ohio, assignor to Salem Industries
Reexamination Request No. 90/002,038, Jun. 4, 1990.
Reexamination Certificate for Patent No. 3,870,474, issued Mar. 11, 1975, Ser. No. 305,997, Nov. 13, 1972.
Filed Jun. 4, 1990, Ser. No. 305,997
Int. Cl.[5] F23G *7/06*
U.S. Cl. 422—171



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **15–18**, **19** and **20** is confirmed.

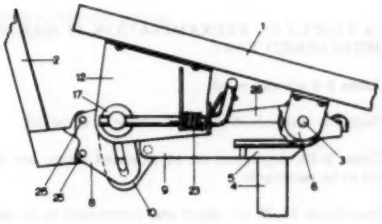
Claims **2** and **11–12** are cancelled.

Claim **1** is determined to be patentable as amended.

Claims **3–10** and **13–14**, dependent on an amended claim, are determined to be patentable.

1. A regenerative incinerator system comprising [a plurality of] *at least three* regenerators each containing packing material, directing means for alternately directing the contaminated air or gas through said regenerators first in one direction and then in the reverse direction to purify the contaminated air and transfer heat from the packing material to the air and vice versa, a combustion chamber common to all of said regenerators for receiving the air passing from one regenerator to another to assure complete oxidation of the contaminants in the air prior to being discharged from the system, and purging means *comprising a fan having an intake connectable to the outlet of the regenerator operating with air flow in said one direction and a outlet connectable to a second one of the regenerators operating with air flow in said reverse direction* for purging said *second one of said* regenerators of any contaminated air remaining [in said regenerators] *therein* when the flow of air through said regenerators is reversed [and] *thereby* reintroducing such purged air back into said combustion chamber *under positive pressure* to remove the contaminants from the purged air prior to being discharged from the system.

B1 4,198,094 (1442nd)
WORKING CHAIR
Anders Bjerknes, Ranunkelveien 34,, Oslo 8, and Reudi á Porta, St. Olavsgt. 7, Oslo 1, both of Norway
Reexamination Request No. 90/002,112, Aug. 20, 1990.
Reexamination Certificate for Patent No. 4,198,094, issued Apr. 15, 1980, Ser. No. 935,417, Aug. 22, 1978.
Filed Aug. 20, 1990, Ser. No. 935,417
Claims priority, application Norway, Aug. 25, 1977, 772943
Int. Cl.[5] A47C *1/00*
U.S. Cl. 297—306



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

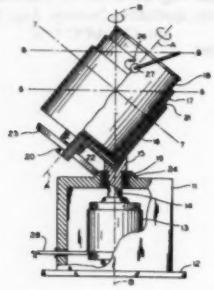
The patentability of claims **1–9** is confirmed.

1. In a working chair including:
an underframe; at least one horizontal shaft mounted in said underframe; a seat member pivotable about said horizontal shaft; a back member pivotable about said horizontal shaft; releasable locking means for fixing said seat and back members in a chosen position relative to each other, said locking means comprising a first number of friction plates connected to said underframe, a second number of friction plates connected to said back member, and clamping means for clamping together said first and second numbers of friction plates; the improvement comprising:
(a) support means for supporting said first number of friction plates at a distance from said horizontal shaft;
(b) a back member carrier fixed to said back member for supporting said second number of friction plates;
(c) a holder attached to the underside of said seat member, said clamping means being mounted in said holder; and
(d) spring-actuated handle means mounted in said holder and normally urged against said clamping means to clamp said numbers of friction plates in a desired relative position, said handle means being manually operable to unclamp said clamping means to permit repositioning of said plates.

B1 4,235,553 (1443rd)
MATERIAL MIXER

John C. Gall, Chicago, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.

Reexamination Request Nos. 90/001,458, Mar. 4, 1988 and 90/001,542, Jun. 28, 1988.
Reexamination Certificate for Patent No. 4,235,553, issued Nov. 25, 1980, Ser. No. 58,034, Jul. 16, 1979.
Continuation-in-part of Ser. No. 945,544, Sep. 25, 1978, abandoned. This application Mar. 4, 1988, Ser. No. 58,034
Int. Cl.[5] B01F *9/00*
U.S. Cl. 366—208



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–6** are cancelled.

Claim **7** is determined to be patentable as amended.

Claims **8–10**, dependent on an amended claim, are determined to be patentable.

New claims **11–29** are added and determined to be patentable.

7. A method of mixing at least partially flowable material *wherein said at least partially flowable material is paint* in a container comprising continuously, non-orbitally rotating the container in one direction about a first axis and simultaneously rotating the container in the same direction about a second axis which is non-perpendicular to the first axis, said first axis non-orbitally rotating about said second axis.

B1 4,349,987 (1444th)
DOLL WHICH RISES FROM PRONE TO STANDING POSITION

Philip D. Bart, 9864 NW. 13th Ct., Coral Springs, Fla. 33065

Reexamination Request No. 90/001,305, Aug. 7, 1987.
Reexamination Certificate for Patent No. 4,349,987, issued Sep. 21, 1982, Ser. No. 169,675, Jul. 17, 1980.
Filed Aug. 7, 1987, Ser. No. 169,675
Int. Cl.[5] A63H *11/18*
U.S. Cl. 446—355

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–18** is confirmed.

1. A robot doll comprising a torso with a hip part at the bottom thereof, and a 1st axis through said hip part, leg means mounted on said doll and pivotable about said 1st axis; drive means in the torso for causing said leg means and torso to pivot relative to each other, whereby

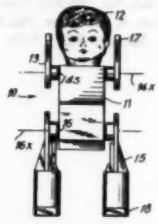
said doll is movable between positions of a series of positions including, with respect to a generally horizontal support surface, at least four positions, namely:

(A) prone face-down with leg means and torso generally aligned,

(B) face down with torso and leg means in inverted V-position with hip part elevated,

(C) said inverted V-position with said leg means oriented generally vertically, and

(D) erect position with said leg means and torso generally aligned and vertical, and



1st switch means for activating said drive means to pivot said leg means and torso causing said doll to move from position (A) to position (B), said doll having configuration and weight distribution such that when the doll moves from position (A) to (B) its center of gravity shifts rearward causing said doll to tip rearward into position (C), and

2nd switch means including means for automatically activating said drive means in response to the arrival of said doll at said position (C) to pivot said leg means and torso from pivoted position (C) to said erect position (D), whereby said doll stands.

B1 4,392,580 (1445th)
CLOSURE CAP

Charles S. Ochs, Lancaster, Ohio, assignor to Anchor Hocking Corp., Lancaster, Ohio

Reexamination Request No. 90/001,836, Aug. 31, 1989.
Reexamination Certificate for Patent No. 4,392,580, issued Jul. 12, 1983, Ser. No. 285,610, Jul. 21, 1981.
Filed Aug. 31, 1989, Ser. No. 285,610
Int. Cl.[5] B65D *41/04*
U.S. Cl. 215—332

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–13** and **14** are cancelled.

[1. In a closure cap having a metal shell with a cover and a depending skirt and having a flowed-in plastisol sealing gasket and inwardly projecting lugs formed on the bottom of the skirt for engaging lugs on a container the improvement comprising said cap skirt having a tapered upper portion extending downwardly and outwardly to the top of a generally cylindrical lower skirt portion, said sealing gasket being positioned in a downwardly facing channel extending radially outwardly to the top of said tapered skirt portion and said tapered upper portion having a radial dimension approximately equal to the radial width of the cap lugs and a vertical dimension greater than half of the skirt height.**]**

B2 4,459,526 (1446th)

MULTI APERTURED LENS SHOCK WAVE PROBE

Elmer L. Griebeler, West Bloomfield, Mich., assignor to Cleveland Machine Controls, Inc., Valley View, Ohio

Reexamination Request No. 90/001,805, Jun. 30, 1989.
Reexamination Certificate for Patent No. 4,459,526, issued Jul. 10, 1984, Ser. No. 335,331, Dec. 29, 1981.
Reexamination Certificate B1 4,459,526, issued Jul. 11, 1989.
Continuation-in-part of Ser. No. 155,944, Jun. 3, 1980, Pat. No. 4,326,155. This application Jun. 30, 1989, Ser. No. 335,331
Int. Cl.[5] G05B *19/36*
U.S. Cl. 318—576

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–77 is confirmed.

1. A working sensing probe that senses the locus of work to be performed, including the loci of a continuum of such work, without physically contacting the work, comprising

means for generating a sudden pressure wave from the work,

means for receiving the reflection of a sudden pressure wave,

means for limiting the spread of the pressure wave,

means for limiting the angle of sensitivity of the receiver,

means for recognizing the influence of the work on the reflected sudden pressure wave,

and means for translating the recognized influence into an electric signal within the control system.

STATUTORY INVENTION REGISTRATIONS

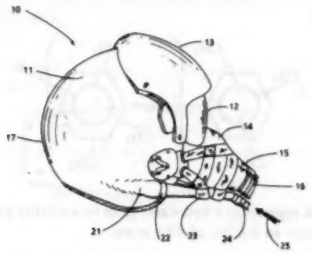
PUBLISHED APRIL 2, 1991

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H902
AIR COOLED HELMET

David G. Rousseau, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 27, 1989, Ser. No. 302,524
Int. Cl.[5] A42B *3/02*
U.S. Cl. 2—414 **5 Claims**



1. A protective helmet for applying cooled air to the head of a person, comprising:

an outer shell;

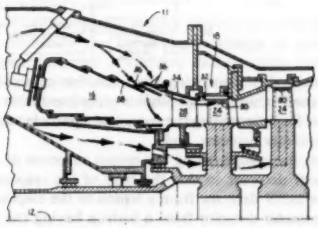
an open cell foam liner, said foam liner having an edge and first and second principal surfaces, said first principal surface affixedly attached to the internal periphery of said outer shell and said second principal surface juxtaposed the normal position of the head of said person when wearing said helmet, said foam liner further having an internal capillary system, said capillary system in fluid communication with a multiplicity f pores opening along said second principal surface; and,

at least one cool air inlet duct affixedly attached to said outer shell, said cool air inlet duct in fluid communication with the internal capillary system of said open cell foam liner.

H903
COOL TIP COMBUSTOR

Barry Weinstein, Georgetown, Mass., assignor to General Electric Company, Lynn, Mass.

Filed May 3, 1982, Ser. No. 374,355
Int. Cl.[5] F02C *1/00*
U.S. Cl. 60—757 **5 Claims**



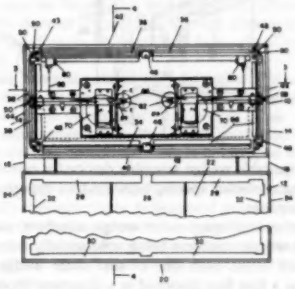
1. In a gas turbine engine having a compressor, a combustor, a turbine section with a turbine nozzle and turbine blades, all in serial flow relationship and disposed radially about an engine centerline, means for cooling tips of said turbine blades comprising:

an inner wall section extending radially inwardly and in a downstream direction from a radially outer wall section of a downstream end portion of said combustor, said inner and outer wall sections defining a first annulus therebetween, said outer wall section including a plurality of first inlet air holes in flow communication with said first annulus, said first holes being sized for channeling a predetermined amount of high-pressure cooling air from said compressor, for forming a cooling air film that extends downstream from said first annulus and along a radially outer wall of said turbine section to cool said turbine blade tips.

H904
SAFE SECURE SURVIVABLE DOOR LOCKING ASSEMBLY FOR AN OVERPACK CONTAINER

Albertus E. Schmidlin, Caldwell, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 27, 1989, Ser. No. 441,782
Int. Cl.[5] A45C *13/10*; **E05B** *63/00*
U.S. Cl. 206—3 **14 Claims**



1. An overpack container assembly, which comprises:

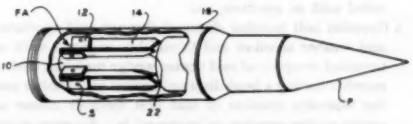
a container body defining a storage chamber provided with peripherally-disposed latching members; and

a door assembly having peripherally-disposed bar means for engaging said peripherally-disposed latching members.

H905
FIN ASSEMBLY

Mark M. Rottenberg, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 13, 1990, Ser. No. 582,733
Int. Cl.[5] F42B *10/14*
U.S. Cl. 244—3.28 **3 Claims**



1. In a fin assembly adapted for rear mounting on a projectile, said fin assembly comprising a body having a fin hub, which said body has a longitudinal axis and a front adapted for mounting to the projectile and a plurality of angularly spaced

fins pivotally mounted on said body for rotating outwardly form an axial to an extended position, each of said fins having a pivot point and a center of gravity, the center gravity for each fin in the axial position being spaced radially inward from said pivot point,

said body adapted to at least partially receive and retain each of said fins when in said axial position.

H906

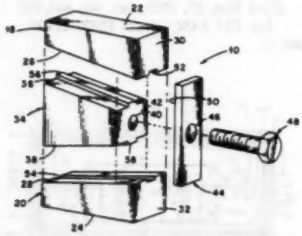
WEDGE ASSEMBLY FOR ELECTRICAL TRANSFORMER COMPONENT SPACING

Franklin E. Baggett, Paducah, and W. Franklin Cage, LaCenter, both of Ky., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 4, 1990, Ser. No. 532,545

Int. Cl.[5] F16B *2/14*

U.S. Cl. 403—409.1 **12 Claims**



1. An adjustable wedge assembly device for establishing and maintaining a selected spacing between two opposing surfaces, which comprises:

a pair of spaced apart outer wedge members, each of said outer wedge members being substantially mirror images of each other, each one of said outer wedge members having a first face disposed in a direction opposite to the other outer wedge member so as to contact one of said opposing surfaces to be spaced, and a tapered second face disposed in a direction toward the other outer wedge member, each of said outer wedge members having a first end and a further end, said further ends of said outer wedge members diverging from each other relative to said first ends;

a center wedge member disposed between said outer wedge members, said center wedge member having oppositely disposed tapered edges slidably in contact with said second faces of said outer wedge members, said center wedge member having a first end and a further end, and being provided with a threaded receptor communicating with said first end of said center wedge member;

a washer member disposed against said first ends of said outer wedge members, said washer member being provided with an aperture; and

a threaded bolt member disposed through said aperture of said washer member and threadably engaged with said threaded receptor of said center wedge member, said bolt member having a head disposed against said washer member whereby rotation of said bolt member causes said center wedge member to be moved in a direction toward said first ends of said outer wedge members whereby said center wedge member further separates said pair of outer wedge members to engage said first faces with said surfaces to be separated.

H907

PROCESS FOR PRODUCING CONDUCTIVE GRAPHITE FIBER

Kazuito Tate, Kanagawa; Koji Tsuchimoto, Chiba, and Kazuhiro Yanagida, Kanagawa, all of Japan, assignors to Mitsubishi Oil Co., Ltd., Tokyo, Japan

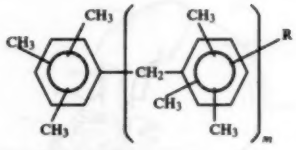
Filed Jun. 16, 1988, Ser. No. 207,482

Claims priority, application Japan, Jun. 19, 1987, 62-151237

Int. Cl.[5] C01B *31/04*

U.S. Cl. 423—448 **4 Claims**

1. A process for producing a graphite fiber which comprises melt-spinning an optically anisotropic pitch, making the resulting fiber infusible, carbonizing the infusible fiber, and graphitizing the carbonized fiber at a temperature of from 2500° to 3000° C., wherein said optically anisotropic pitch is prepared by heat treating a compound represented by formula (I):



wherein R represents a hydrogen atom or a methyl group; and m represents an integer of 1 or more.

H908

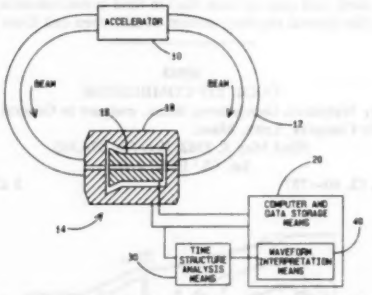
METHOD AND SYSTEM FOR IMPROVED RESOLUTION OF A COMPENSATED CALORIMETER DETECTOR

John W. Dawson, Willowbrook, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 23, 1989, Ser. No. 355,522

Int. Cl.[5] G01J *1/00*

U.S. Cl. 250—336.1 **3 Claims**



1. A method of improving the resolution of a calorimeter detector used in high energy physics experiments that includes:

a means for determining the energy of a particle entering the calorimeter detector, and

a means for compensating the output response of the calorimeter detector so that the ratio of the response of the calorimeter detector from a lepton to the response of the calorimeter detector from a hadron having the same energy as the lepton is approximately equal to 1, the improved method comprising:

inferring the hadron content of the response of the calorimeter detector based upon the time structure of the output response,

correcting the energy measurement of the calorimeter based

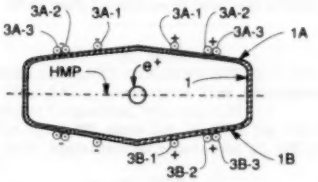
on the determination of the hadron content of the calorimeter response.

H909

METHOD OF CORRECTING EDDY CURRENT MAGNETIC FIELDS IN PARTICLE ACCELERATOR VACUUM CHAMBERS

Gordon T. Danby, Wading River, and John W. Jackson, Shoreham, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 19, 1990, Ser. No. 505,289
Int. Cl.[5] H01J *23/34, 29/06*
U.S. Cl. 328—233 6 Claims



1. A method of correcting undesired magnetic field aberrations that are produced by eddy currents induced in a metallic vacuum chamber of an accelerator by magnetic fields that are produced by energization of particle beam-positioning electromagnets which are operably mounted adjacent to the vacuum chamber for confining electrically charged particles in stable orbits while the charged particles that enter and exit the vacuum chamber through apertures in its walls are driven by an rf accelerating field, comprising,

(a) attaching correction windings to the outside surface of the vacuum chamber at predetermined locations thereon,

(b) providing secondary coils for supplying electric power to said correction windings, and providing a variable resistor,

(c) electrically connecting said secondary coils in series with the correction windings, with the variable resistor operably positioned in the series circuit between the secondary coils and the correction windings,

(d) providing means for supplying electric power to the secondary coils as a function of a predetermined proportion of the electric power in a beam of charged particles that is accelerated through said vacuum chamber, so that as the electric power in the charged particle beam line varies, the electric power in the secondary coils varies proportionately and,

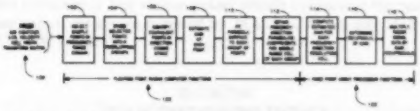
(e) adjusting the variable resistor thereby to cause the resultant current in the correction windings to generate a magnetic flux that effectively cancels eddy current induced aberration flux fields that are induced in the vacuum chamber by the beam confining magnets while the charged particles are accelerated through the chamber.

H910

ADAPTIVE TWO DIMENSIONAL SHADING FOR BATCH SYNTHETIC APERTURE RADAR USING PHASED ARRAY ANTENNA

Laurence J. Hindenach, Jessup, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 8, 1989, Ser. No. 363,667
Int. Cl.[5] G01S *13/00*
U.S. Cl. 342—25 14 Claims



1. A method for amplitude equalizing the target return echo signals of a batch processed synthetic aperture pulsed doppler radar in accommodation of beam shape and target range perturbations of the return signal amplitudes over a target scene frame comprising the steps of:

storing a target scene frame array of doppler frequency and range domain radar echo signal amplitudes data, said data being organized according to range cells dispersed across said target scene frame;

selecting a predetermined number of points in the doppler frequency and range domain for performing antenna beam shape gain determinations;

transforming the location of said gain determination points from the doppler frequency and range domain into points within the domain of an antenna face related coordinate system;

performing antenna pattern gain determinations at each of said antenna coordinate domain points assuming a predetermined three dimensional beam shape;

incorporating range attenuation effect correction into each of said antenna coordinate domain points gain determinations;

determining the numeric coeffecients for a selected mathematically definable three dimensional gain surface extending in both the frequency and range directions, said gain surface being optimally conformed with said range attenuation effect correction inclusive antenna coordinate domain points;

dividing said mathematically definable three dimensional gain surface into a predetermined number of range associated bands, each band including all of the frequency related gain surface values for a selected span of range values;

ascertaining for the central most range values in each of said range bands, the numerical coefficients of a gain surface resident two-dimensional mathematical curve of gain versus frequency;

computing from each of said two-dimensional mathematical curves the gain values at predetermined range cell locations disposed along each said curve;

generating from said gain values a resolution cell dispersed array of inverse gain magnitude values;

multiplying the amplitude values of said target frame range cell data by range cell respective inverse gain array values.

REISSUES

APRIL 2, 1991

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,562
FUEL COMPOSITION

Stephen L. Badger, Jackson, Miss., assignor to Alcofuels, Inc., Vicksburg, Miss.

Original No. 4,405,336, dated Sep. 20, 1983, Ser. No. 288,418, Jul. 30, 1981. Application for reissue Sep. 18, 1985, Ser. No. 777,540

Int. Cl.[5] **C10L** *1/18*

U.S. Cl. 44—438 **7 Claims**

1. A composition comprising:
1000 parts by volume of at least 90%/180 proof ethyl alcohol;
60–90 parts by volume of methylisobutyl ketone;
20–50 parts by volume of kerosene;
30–60 parts by volume of xylenes, and
[20–50] *30–60* parts by volume of isopropyl alcohol.

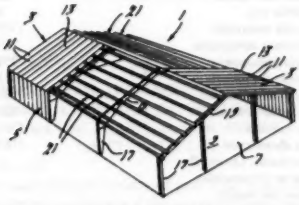
Re. 33,563
METAL PANEL ROOFING STRUCTURE

Robert E. Heckelsberg, Germantown, Tenn., assignor to AMCA International Corporation, Hanover, N.H.

Original No. 4,213,282, dated Jul. 22, 1980, Ser. No. 875,524, Feb. 6, 1978. Application for reissue Jan. 25, 1982, Ser. No. 342,151

Int. Cl.[5] **E04B** *1/76*

U.S. Cl. 52—404 **5 Claims**



1. In a roof structure having horizontally extending support purlins, the combination of a plurality of elongated roof panels located side by side and supported on said purlins, the lengths of said panels extending transversely to the lengths of said purlins, adjacent panels having edges interlocked with each other to form joints that join the panels together, an insulative layer supported on said purlins between and in contact with said panels and purlins and covering substantially the same total area as said panels, panel mounting clips having upwardly projecting tab portions secured to said panels and base portions bearing against the upper side of said insulative layer and secured to said purlins to provide means for attaching the panels to the purlins, said tab portions extending into said joints to mechanically secure said clip to said adjacent panels, means flexibly attaching said tab portions to said base portions in relatively movable relationship to provide for movement of said panels relative to said purlins, *resilient means for yieldably holding said tab portions in predetermined positions relative to said base portions, said resilient means including means defining an elongated slot extending transversely to said purlins and wherein said tab portion includes holding portion substantially filling the narrower dimension of the slot and being resilient in the direction of said narrower dimension,* and insulative thermal blocks extending lengthwise of and directly over said purlins and bearing against the upper side of said insulative layer on said purlins, said blocks extended between the base portions of adjacent panel mounting clips, said base portions having tangs thereon which project into ends of said thermal blocks holding said blocks in place, said panels being supported on the tops of said thermal blocks.

* * * * *

The questions raised in reexamination request No. 90/000,342, filed Mar. 16, 1983, have been considered and the results thereof are reflected in this reissue patent which constitutes the reexamination certificate required by 35 U.S.C. 307 as provided in 37 CFR 1.570(e).

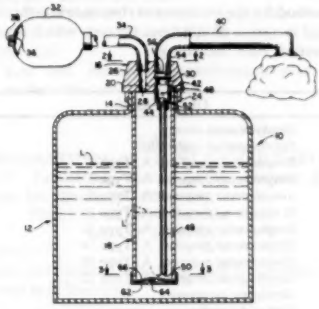
Re. 33,564
FOAM DISPENSING DEVICE

George W. Ford, Jr., Salt Lake City, Utah, assignor to Ballard Medical Products, Midvale, Utah

Original No. 4,531,660, dated Jul. 30, 1985, Ser. No. 614,704, May 29, 1984. Continuation of Ser. No. 330,254, Dec. 14, 1981, abandoned. Application for reissue Dec. 23, 1985, Ser. No. 812,672

Int. Cl.[5] **B65D** *37/00*

U.S. Cl. 222—209 **14 Claims**



1. A foam dispenser device, comprising
(a) an outer *large* container, for holding *a substantially enlarged quantity of* foamable liquid, having a [discharge] port, [and]
(b) *foam outlet means,*
(c) a foam producing unit mounted to the container and separating the area adjacent the [discharge] *outer container* port and the interior of the container, said [form] *foam* producing unit including;
1. an [inner] *small* container disposed within the outer container, and having an opening communicating with said outer container,
2. a closure for the [inner] *small* container having pressurized air inlet means communicating [with] *air under positive pressure to* the [inner] *interior of the small* container [and foam outlet means] *but not to the interior of the outer container,*
3. foam producing means communicating [with] *foam to* the foam outlet means, said foam producing means including air-receiving means communicating with the air inlet means to receive pressurized air and liquid-receiving means including an inwardly extending conduit having an opening communicating with the interior of the [inner] *small* container to receive liquid,
4. valve means for the inner container opening, said valve means selectively closing said opening when air pressure within the [inner] *small* container is increased, to supply foamable liquid from the [inner] *small* con-

tainer to the conduit of the foam producing means, said valve means selectively opening said opening when air pressure within the [inner] *small* container is decreased to permit flow of foamable liquid from the outer container to the [inner] *small* container, and

[(c) a] *(d)* pump means supplying pressurized air to the air inlet means, said pump means including an opening communicating with ambience and valve means selectively closing said opening when air pressure within the pump means is increased and selectively opening said opening when air pressure within the opening is decreased to admit air into said pump means.

Re. 33,565

PREVENTION AND TREATMENT OF RHEUMATOID ARTHRITIS

Ralph J. Stolle, Lebanon, Ohio, and Lee R. Beck, Birmingham, Ala., assignors to Stolle Research and Development Corporation, Cincinnati, Ohio

Original No. 4,732,757, dated Mar. 22, 1988, Ser. No. 558,909, Dec. 9, 1983. Continuation of Ser. No. 875,140, Feb. 6, 1978, abandoned. Application for reissue Aug. 11, 1988, Ser. No. 231,219

Int. Cl.[5] **A61K** *39/116, 39/085, 39/112, 37/04*

U.S. Cl. 424—87 **4 Claims**

1. A method for the treatment of rheumatoid arthritis caused by a mixed spectrum of infectious bacteria which reside in the gastrointestinal tract, including:

ORGANISMS
Staphylococcus aureus
Staphylococcus epidermidis
Streptococcus pyogenes, A. Type 1
Streptococcus pyogenes, A. Type 3
Streptococcus pyogenes, A. Type 5
Streptococcus pyogenes, A. Type 8
Streptococcus pyogenes, A. Type 12
Streptococcus pyogenes, A. Type 14
Streptococcus pyogenes, A. Type 18
Streptococcus pyogenes, A. Type 22
Aerobacter aerogenes
Escherichia coli
Salmonella enteritidis

-continued

ORGANISMS
Pseudomonas aeruginosa
Klebsiella pneumoniae
Salmonella typhimurium
Haemophilus influenzae
Streptococcus viridans
Proteus vulgaris
Shigella dysenteriae
Streptococcus, Group B
Diplococcus pneumoniae
Streptococcus mutans
Corynebacterium, Acne, Types 1 & 2

which comprises the oral administration of a quantity of non-fat milk solids equivalent to one quart of immunized cow's milk I_gG, [post-prandially] two times daily, wherein the cow's milk [IgG] includes antibodies produced by the following microorganisms from American Type Culture Collection bacterial antigens:

ORGANISM	*ATCC NO.
Staphylococcus aureus	11631
Staphylococcus epidermidis	155
Streptococcus pyogenes, A. Type 1	8671
Streptococcus pyogenes, A. Type 3	10389
Streptococcus pyogenes, A. Type 5	12347
Streptococcus pyogenes, A. Type 8	12349
Streptococcus pyogenes, A. Type 12	11434
Streptococcus pyogenes, A. Type 14	12972
Streptococcus pyogenes, A. Type 18	12357
Streptococcus pyogenes, A. Type 22	10403
Aerobacter aerogenes	884
Escherichia coli	26
Salmonella enteritidis	13076
Pseudomonas aeruginosa	7700
Klebsiella pneumoniae	9590
Salmonella typhimurium	13311
Haemophilus influenzae	9333
Streptococcus viridans	6249
Proteus vulgaris	13315
Shigella dysenteriae	11835
Streptococcus, Group B	
Diplococcus pneumoniae	
Streptococcus mutans	
Corynebacterium, Acne, Types 1 & 2	

PLANT PATENTS

GRANTED APRIL 2, 1991

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,484
MINIATURE ROSE PLANT NAMED 'MOTHER'S LOVE'

Cecilia L. D. Bennett, deceased, late of Chula Vista, Calif. (by Susan M. O'Brien, executor), assignor to Susan O'Brien, Chula Vista, Calif.

Filed Jan. 2, 1990, Ser. No. 460,234
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of miniature rose plant named, 'Mother's Love' of hardy, dwarf, vigorous growth, well-branched and attractive in appearance, substantially as illustrated and described, characterized by its hybrid tea-form blooms, ranging from near Empire Rose to near Delft Rose with a base of ranging from near Egyptian Buff to near Amber Yellow, with flowers borne usually one to a stem but occasionally in sprays of 3 to 5 or more.

7,485
BOSC PEAR—WIMMERS CULTIVAR

Robert L. Wimmers, 2500 Reed Rd., Hood River, Oreg. 97031

Filed Dec. 21, 1989, Ser. No. 456,850
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—36 **1 Claim**

1. A new and distinct variety of pear tree which is believed to be a whole tree mutation of the standard Bosc pear variety, substantially as illustrated and described, capable of forming quality fruit which (a) assumes a uniform russet appearance at least one month earlier than other known Bosc pear varieties, (b) assumes an attractive bronze coloration when ripened, (c) bears small inconspicuous dots on the fruit surface, (d) exhibits a slightly roughened surface texture, (e) tends to exhibit a higher soluble solids content when ripened than other known Bosc pear varieties, (f) tends to be sweeter than other known Bosc pear varieties, and (g) is ready for picking approximately one week later than the standard Bosc pear variety.

7,486
LILY PLANT NAMED WHITE SHEEN

Joseph E. J. van Riet, Koewachtsteenweg 7, 9080 Moerbeke-Waas, Belgium

Filed Feb. 28, 1990, Ser. No. 489,342
Int. Cl.[5] A01h *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new cultivar of lily plant named White Sheen, as illustrated and described.

7,487
CHRYSANTHEMUM PLANT NAMED TOPACIO

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Feb. 26, 1990, Ser. No. 481,102
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—76 **1 Claim**

1. A new and distinct Chrysanthemum plant named Topacio, as described and illustrated.

7,488
CHRYSANTHEMUM PLANT NAMED NAPLES

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Feb. 16, 1990, Ser. No. 481,068
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—77 **1 Claim**

1. A new and distinct Chrysanthemum plant named Naples, as described and illustrated.

7,489
CHRYSANTHEMUM PLANT NAMED PASION

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Feb. 16, 1990, Ser. No. 481,103
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—80 **1 Claim**

1. A new and distinct Chrysanthemum plant named Pasion, as described and illustrated.

PATENTS

GRANTED APR. 2, 1991

ERRATA

For CLASS	See PATENT NO.
425-185	5,003,665
452-021	5,003,666
452-125	5,003,667
049-479	5,003,792
101-228	5,003,889
280-605	5,004,065
180-068	5,004,081
190-018	5,004,091
220-366	5,004,129
411-366	5,004,361
418-132	5,004,412
137-625	5,004,440
350-096	5,004,447
004-325	5,004,462
526-258	5,004,560
002-408	5,004,567
424-465	5,004,651
435-007	5,004,699
524-089	5,004,759
530-322	5,004,818
536-018	5,004,833
315-224	5,004,947
320-013	5,004,963
354-442	5,005,047
378-035	5,005,075
235-492	4,999,601

PATENTS

GRANTED APRIL 2, 1991

GENERAL AND MECHANICAL

5,003,630
PRESSURE GARMENT
John W. Bassick, Paxton, and Edward A. Dubois, Auburn, both of Mass., assignors to David Clark Company Incorporated, Worcester, Mass.
Filed Oct. 23, 1989, Ser. No. 424,994
Int. Cl.[5] B64D *10/00*
U.S. Cl. 2—2.1 A **5 Claims**

1. In a pressure garment of the type worn by crew members in high performance high altitude aircraft and space vehicles, said garment having a pressure bladder arranged to cover at least a portion of a wearer's body, said pressure bladder being expandable in response to the introduction therein of a pressurized gas to thereby apply pressure to the enveloped portion of the wearer's body, the improvement comprising:

said bladder being defined by flexible micro-porous material consisting of at least two layers, one of said layers being hydrophilic and facing inwardly toward the wearer's body, and the other of said layers being hydrophobic and facing outwardly away from the wearer's body, whereupon pressurized gas introduced into said bladder will be retained therein by the hydrophilic layer of said material, and water vapor from the wearer's body will be permitted to pass through the hydrophilic and hydrophobic layers of said material to the exterior of said garment.

5,003,631
FLIGHT HELMET WITH HEADSET
William T. Richardson, Whittier, Calif., assignor to Northrop Corporation, Hawthorne, Calif.
Filed Oct. 5, 1989, Ser. No. 417,331
Int. Cl.[5] A42B *3/30*
U.S. Cl. 2—6 **12 Claims**

1. A flight helmet with headset custom fit to the head and ears of a particular individual comprising an outer shell of rigid material shaped to cover the head of the wearer and having a peripheral edge lying along the back of the neck and extending forwardly beneath the ears,

an inner layer of resilient elastomeric material,

a conformable liner of thermoplastic material formed with a generally hemispherical shape, said liner being heated to a temperature at which it can be shaped and inserted into the shell which is then placed on and forced into conformity with the head of the individual for whom it will fit,

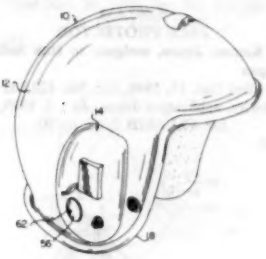
adhesive means for securing the liner, the layer and the shell together as a unitary structure,

means forming left and right ear apertures in the shell,

left and right ear cups selected to fully cover the ears of said individual, said ear cups being placed in said apertures, respectively, and positioned while the helmet is worn by said individual so that the ear cups are in a proper sealing position relative to the individual's ear positions,

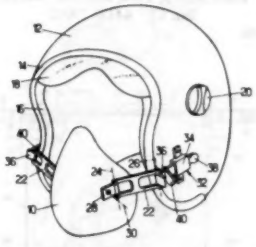
adhesive means for permanently affixing the ear cups to the helmet and liner,

an expandable seal surrounding the ear cups so that between the earcup and the head of the wearer a close, noise isolat-



ing seal is formed completely around each ear between the head and each earcup.

5,003,632
DEVICE FOR CONNECTING A BREATHING MASK TO A HELMET
Jacques Claude, Fresnes, France, assignor to Intertechnique, France
Filed Apr. 7, 1989, Ser. No. 334,509
Claims priority, application France, Apr. 7, 1988, 88 04616
Int. Cl.[5] A42B *3/00*
U.S. Cl. 2—6 **12 Claims**



1. A device for connecting a shell of a breathing mask to a helmet, comprising two fasteners each placed on one of a median vertical plane of the helmet and each having:

a quick fastening and unfastening attachment unit including a receptacle fixed rigidly to the helmet and an assembly insertable into and positively releasibly lockable in said receptacle in an adjustable position, and

a link constructed to resist vertically directed flexure forces and nonextensible, one of the end portions of the link being permanently connected to the shell by first pivotal connection means allowing rotational movement of the mask with respect to the link about a first axis perpendicu-

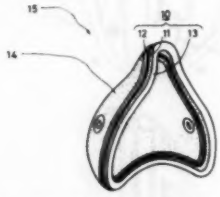
lar to the direction of the link and substantially parallel to said median vertical plane and the other end portion of the link being permanently connected to said assembly by second pivotal connection means allowing rotational movement of the link with respect to the attachment unit about a second axis substantially parallel to said first axis.

5,003,633

FACE PROTECTOR

Akira Itoh, Komae, Japan, assignor to Itoh Seiki Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1989, Ser. No. 422,832
Claims priority, application Japan, Jun. 2, 1989, 1-140693
Int. Cl.[5] A62B *7/10, 18/00*
U.S. Cl. 2—9 6 Claims



1. A seal device for a face protector used in a state fitted closely to a user's face comprising:

a seal member made of a material which is rigid at room temperature and is softened when heated at a temperature within a range from 40° C. to 65° C. and having a shape formed in situ against and in substantial exact conformity with the user's face by placing the heated and softened material of the seal member directly on the user's face in direct contact therewith;

an airtight elastic member provided between the seal member and the face protector; and

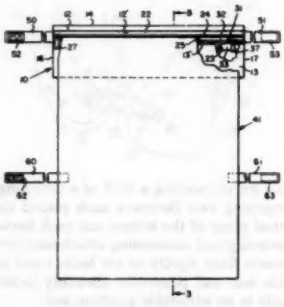
an airtight elastic member secured to the surface of the seal member on the side of the user's face.

5,003,634

BELT TYPE GARMENT WITH FOLDABLE SEAT COVER

Robert J. Brinkman, 325 VanVoorhis Ave., Rochester, N.Y. 14617

Filed Apr. 9, 1990, Ser. No. 506,226
Int. Cl.[5] A41D *27/12*
U.S. Cl. 2—46 9 Claims



1. A belt type garment, comprising

means defining an elongate, flexible pouch having thereon a pair of confronting, longitudinally extending edges defining therebetween an elongate opening in one side of said pouch,

zipper means on said confronting edges of said pouch for releasably closing said opening,

a first set of flexible strap elements projecting from opposite ends, respectively, of said pouch and disposed to be releasably secured around a person's waist to support said pouch above and in registry with the person's seat,

a flexible, waterproof panel secured at one end thereof to one of said confronting edges of said pouch for movement between an operative position in which said panel extends at its opposite end out of said opening and downwardly behind said person's seat, when the pouch is mounted thereabove, and a collapsed position in which said panel is rolled up and positioned within the interior of said pouch, and

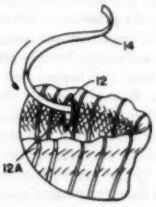
a second set of flexible strap elements projecting from opposite sides, respectively, of said panel and disposed to be releasably secured around a person's legs, when said panel is in its operative position, thereby releasably to retain said panel in said operative position.

5,003,635

CLOTHING INCLUDING INSECT REPELLENT STRIPS

James H. Peterson, 1951 Montview Dr., Greeley, Colo. 80631

Filed Sep. 7, 1989, Ser. No. 404,210
Int. Cl.[5] A41D *13/00*; A42B *1/00*
U.S. Cl. 2—69 11 Claims



1. An article of clothing to be worn on the human body including a flexible insect-repellent strip which is adapted to conform to the portion of said body covered by said article; wherein said article comprises a stocking having an elastic upper portion, and wherein said flexible strip is carried by said upper portion.

5,003,636

NECKTIE DEVICE

Eugene J. Marostica, 221 Lyon St., Apt. #1906, Ottawa, Ontario, Canada

Filed Feb. 26, 1990, Ser. No. 484,930
Claims priority, application Canada, Jun. 6, 1989, 601942
Int. Cl.[5] A41D *25/00*
U.S. Cl. 2—145 14 Claims

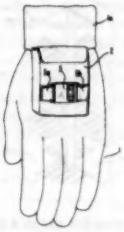
1. A necktie device for enabling the length of a necktie to be substantially correct for a respective wearer, when said necktie is transversely severed intermediate its ends at two spaced-apart locations and the portion therebetween removed, said device comprising:

(a) a pair of tie supports adapted to be secured respectively to the severed ends of said necktie, each of said tie supports having a first elongate part and a second elongate part to receive the associated severed end of said necktie therebetween, and

(b) a connecting unit having a chamber on one side for

receiving and securing one of said tie supports and a chamber on the other side for receiving and securing the other of said tie supports, said connecting unit being adapted to fit under a shirt collar of said wearer and to substantially conform therewith.

5,003,637
GLOVES WITH UTILITY ATTACHMENTS
Edward M. Lonon, 155 Sanford St., East Orange, N.J. 07018
Filed Feb. 1, 1988, Ser. No. 115,208
Int. Cl.[5] A41D *19/00*
U.S. Cl. 2—160 2 Claims



1. A glove comprising in combination a utility attachment; means for removably applying said utility attachment to the external back surface of said glove, which is constructed to overlie a back of a user's hand, which means comprises in combination a pair of complemental parts of hook and loop fasteners, which adhere when pressed together, one of the parts of said pair being sewn or otherwise secured to the external back surface of said glove, and the other part of said pair being sewn or otherwise secured to a rear surface of said utility attachment,

wherein said utility attachment is a hollow container formed from a sheet of flexible material, said container being constructed and arranged to hold one or more of the following items:

cigarette pack, comb, compact, lipstick, nail file, driver's license, medical card, first aid kit, radio, calculator, watch, change purse,

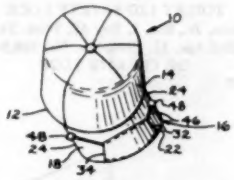
wherein a watch is secured to the outside surface of said container.

5,003,638
STERILIZED GLOVE
Teruyoshi Miyake, and Tatsuo Yamamoto, both of Tokyo, Japan, assignors to Chyugoku Paalu Distributing Corporation; Shinanen New Ceramic Corporation and Shinagawa Fuel Co., Ltd., all of Tokyo, Japan
Filed Mar. 21, 1990, Ser. No. 496,671
Claims priority, application Japan, Dec. 27, 1989, 1-338949
Int. Cl.[5] A41D *13/10*
U.S. Cl. 2—167 6 Claims

1. A sterilized glove comprising:

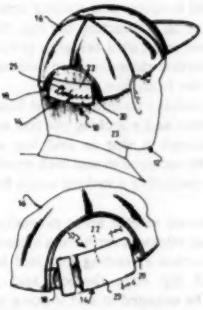
a glove body, and an organic polymer film layer containing an antibacterial zeolite and formed on the entirety of at least one surface of said glove body in an upheaval shape.

5,003,639
CAP VISOR PROTECTOR
Steven L. White, 325 W. Washington, Apt. 5, Jackson, Mich. 49201
Filed Nov. 20, 1989, Ser. No. 438,244
Int. Cl.[5] A42C *5/00*
U.S. Cl. 2—187 6 Claims



1. A visor protector for caps having a visor including a periphery having a front region, lateral regions, and upper and lower sides comprising, in combination, a protective material having first and second portions having first and second ends, respectively, said portions being interconnected by a central region, said material portions including lateral edges intersecting the associated portion end, and attachment means extending from said portions' ends adapted to be affixed to the visor's lateral regions whereby said first and second portions are disposed over the visor upper and lower sides, respectively, and said central region engages the visor periphery front region.

5,003,640
ADVERTISING CAP NAMEPLATE
Anthony Pizzacar, 160 Greenway West, New Hyde Park, N.Y. 11040
Filed Oct. 4, 1989, Ser. No. 417,204
Int. Cl.[5] A42B *1/24*
U.S. Cl. 2—199 8 Claims



1. An advertising cap for a user, comprising:

(a) a conventional cap having a back, and a headband;

(b) a pair of straps disposed at said back of said conventional cap for adjustment of the size of said headband of said conventional cap, said pair of straps having tops;

(c) means for substantially concealing said pair of straps after said headband of said conventional cap is adjusted, said means for substantially concealing said pair of straps being mounted directly over said pair of straps which are now concealed;

(d) means for removably mounting said concealing means so

that said concealing means may be changed depending upon the preference of the user; and

(e) means for advertising being disposed directly onto said concealing means.

5,003,641

TOILET LID SAFETY LOCK

Willis M. Selman, Jr., Rte. 1, Box 67, West, Tex. 76691

Filed Apr. 13, 1990, Ser. No. 508,948

Int. Cl.[5] A47K *13/24*

U.S. Cl. 4—253 8 Claims

1. A toilet lid safety lock for use with a toilet having a water holding tank, a bowl and a seat and a lid pivotally attached to the bowl, the toilet lid safety lock comprising:

a substantially rectangular hollow housing having opposing side edges, a top edge, a front face and a rear face;

means for releasably securing said rear face of said housing to a front face of the toilet tank;

a substantially V-shaped counterbalanced locking arm having the free ends thereof pivotally attached to said side edges of said housing, said locking arm including a rigid bridging portion connecting the legs thereof and spaced from the free ends, said bridging portion having a lock receiving portion extending into said housing through an opening in the from face thereof;

a locking bar slidably mounted in said housing and having a handle portion and a locking portion extending into said housing through a slot in said top edge thereof and adapted to be received in said lock receiving portion, said locking bar including a locking notch formed in one edge thereof;

a counterbalanced release lever pivotally attached to said housing, said release lever having a handle portion and an engaging portion extending into said housing through a slot in said top edge thereof, said engaging portion adapted to be engaged in said locking notch of said locking bar;

said locking arm being mounted on said housing such that it would be held in a raised position against the toilet tank by the raised toilet lid and would fall to a substantially horizontal position extending over the lid when the lid is lowered, said horizontal position of said locking arm enabling said locking bar to fall with said locking portion thereof entering said lock receiving portion of said locking arm and said engaging portion of said release lever entering said locking notch, thereby locking the toilet lid in a closed position.

5,003,642

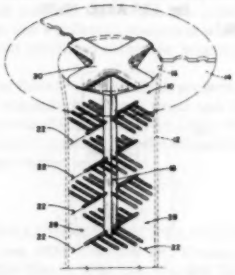
FOREIGN MATTER TRAP FOR SHOWER DRAIN

Wendell E. Robb, 3204 S. 85th E. Ave., Tulsa, Okla. 74145, and William S. Hudson, R.R. 2, Box 3, Lawrence, Kans. 66044

Continuation of Ser. No. 734,801, May 15, 1985, abandoned, which is a continuation of Ser. No. 499,284, May 31, 1983, abandoned. This application May 14, 1986, Ser. No. 866,983

Int. Cl.[5] A47K *1/14*; E03C *1/26*

U.S. Cl. 4—287 11 Claims



1. A foreign matter trap for use in a drain, such as a shower or sink drain, in which water flows downwardly through a drain pipe, comprising:

a trap element removably positionable in a drain pipe, the trap element having a downwardly extending substantially straight longitudinal member;

a plurality of discrete, spaced apart, parallel horizontal layers of foreign matter catching members extending generally radially from said longitudinal member, each horizontal layer being in a plane perpendicular to said longitudinal member and formed of a plurality of closely spaced apart spicule members, the outer ends of which are in engagement with or in close proximity to the internal circumferential surface of a drain pipe for which the trap is dimensioned, each horizontal layer having at least one discrete area having many closely spaced spicule members and at least one discrete area devoid of spicule members whereby the spicule members of each layer cover less that a complete cross-sectional horizontal circumferential area leaving a portion of at least about 90° of the drain cross-sectional area free of spicule members, the layers being arranged such that the spicule members in adjacent upper layers extend over and above the cross-sectional area of the next lower layer free of spicule members whereby water may continue to flow through the drain even when the spicule members of each layer are completely closed by trapped foreign matter.

5,003,643

FLUSH CONTROLLER FOR A TOILET BOWL

Wilson Chung, 5 fl., No. 126, Alley 69, Lane 285, Sec. 1, Nei Hu Road, Taipei, Taiwan

Filed Nov. 14, 1989, Ser. No. 436,231

Int. Cl.[5] E03D *1/00*

U.S. Cl. 4—313 3 Claims

1. A flush controller for a toilet bowl, said toilet bowl including a water reservoir having an outlet cap, said flush controller comprising:

detecting means for detecting that a user has approached said toilet bowl to within a predetermined effective distance, that said user has remained within said predetermined effective distance for a first predetermined period of time, and that said user has left said predetermined effective distance;

a motor, having an output rotation shaft;

cap control means coupled to said output rotation shaft of said motor for being driven by said motor, said cap con-

trol means adapted to be connected to said outlet cap of said water reservoir; and

a control means coupled to said detecting means and said motor

wherein said cap control means includes:

a gear assembly engaged with said output rotation shaft of said motor to be driven by said motor;

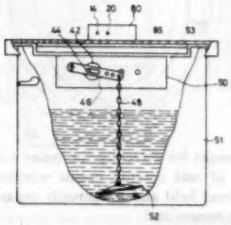
a control wheel connected with said gear assembly for rotation by the driving of said gear assembly, said control wheel having an eccentric pin; and

a control lever of which one end is pivotally connected to said flush controller and the other end is adapted to be connected to said outlet cap of said water reservoir, said control lever having a strip-shaped groove in which said eccentric pin of said control wheel is inserted such that the rotation of said control wheel can move said control lever pivotally between a highest position and a lowest position;

wherein said control means includes:

an original sensor for detecting that said control lever is at its lowest position; and

a midway sensor for detecting that said control lever is at its highest position;



whereby when said detecting means detects that said user has approached said toilet bowl and remained within said predetermined effective distance for said first predetermined period of time, and that said user has left said predetermined effective distance thereafter, said control means actuates said motor to rotate which in turn drives said gear assembly and said control wheel to rotate, moving said control lever pivotally from its lowest position to its highest position so as to open-up said outlet cap, starting the water in said water reservoir to flush; when said midway sensor detects that said lever is at its highest position, said control means stops said motor for a second predetermined period of time to perpetuate the water flushing; at the end of said second predetermined period of time said control means re-actuates said motor to rotate, which in turn drives said gear assembly and said control wheel to rotate again, moving said control lever pivotally from its highest position to its lowest position so as to close said outlet cap, stopping the water flushing; when said origin sensor detects that said control lever is at its lowest position, said control means then stops said motor again, waiting for the next user.

5,003,644

TWO-STAGE WATER DISCHARGE MECHANISM FOR FLUSH TOILET TANK

Chin-Ming Huang, No. 47, Lu Her Road Sec. 1, Lu Kang Chen, Changhua Hsien, Taiwan

Filed Jan. 17, 1990, Ser. No. 466,525

Int. Cl.[5] **E03D** *1/14, 3/12*

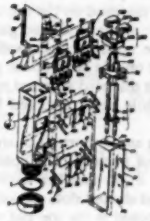
U.S. Cl. 4—324 **3 Claims**

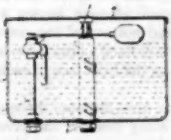
1. An improved two-stage controllable water discharge mechanism for a flush toilet tank comprising:

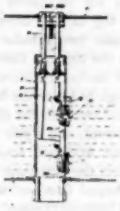
a hollow pipe fixed set having a rectangular opening at the lower end thereof with an externally threaded discharge tube extended downward from the bottom thereof; and a pair of water intakes disposed at one face thereof with a predetermined distance defined therebetween;

a pair of seals each of which is disposed in association with said water intakes;

a couple of paired protrusion rods disposed on the opposite sides of said fixed set with the side having said intakes







disposed in connection therewith, and each pair of said rods positioned at the same height as said water intakes;

a slot disposed on each face of said fixed pipe at the top end thereof; a pair of float valves having a hollow interior, each said valve provided with a pair of protrusions on each of the opposite sides thereof so that the same can be pivotably associated with said hollow pipe fixed set by connecting levers to seal against said water intakes; the inner side of each said float valve disposed with an escape recess and a slanted recess defined on the opposite side

thereof with a through hole disposed therebetween to permit therebetween communication thereof; and a seal piece disposed in association therewith;

a pivotable sealing lid having an extended rod on the reverse side thereof pivotably disposed in said slanted recess with said extended rod going through the seal piece and into said escape recess so that the seal lid seals against said seal piece;

each said float valve having a density less than the density of water so that the same is buoyant in water and drops due to its own weight when not in water;

a U-shaped inner lining member mounted in engagement with said hollow pipe fixed set; a stop edge and a pair of through holes disposed on the top of said U-shaped inner lining member; a pair of slanted guide members disposed on each of the opposite inner walls of said inner lining member at the middle and bottom portions thereof a pair of slanted slots disposed adjacent to said guide members; an overflow hole being disposed between said through holes;

a long pivot arm and a short pivot arm each provided with a C-shaped unit to which the control petal is pivotably associated by a pin member having two ends slidably disposed in said slanted slots on said inner lining member; a pin hole disposed in the top end of each said pivot arm for connection to actuation arms;

a couple of control petals each having a petal body pivotably connected to said long and short pivot arms; each said control petal resiliently limited by a spring member; said control petals disposed inside said hollow pipe fixed set with the same closely abutting against the water intakes; and a seal ring attached to the face of each control petal; a π-shaped guide element having a slanted guide face attached to said bottom of the respective control petal body with springs fixed a protrusion having a slanted slide face disposed on the front face of each said petal body and in operation;

a pair of actuation arms disposed through said through holes of said inner lining member and pivotably engaged with said long and short pivot arms by pins; a spring being used to enable each said actuation arm to be resiliently operated;

a cover having four downward extended engagement walls in register with said four slots of said hollow pipe fixed set so that the cover is engaged therewith; two extended tubular elements for reception of said actuation arms disposed on the top of said cover; a projection rod disposed between said two tubular elements and having a threaded hole at the top end thereof;

a control button set having a button mounting seat provided with three through holes at the bottom thereof to permit the passing of said two tubular elements and said projection rod of said cover; and a pair of buttons engaged with said mounting seat and said actuation arms whereby an operator can effect the actuation of said actuation arms;

said hollow pipe-shaped fixed set secured to a cistern with said easy control buttons exposed outside the cover of said cistern for easy operation.

5,003,645

BIDET ASSEMBLY WITH DRAINAGE

Nelson Alonso, 1701 SW. 32 Ct., Miami, Fla. 33145

Continuation-in-part of Ser. No. 279,741, Dec. 5, 1988. This application Feb. 7, 1990, Ser. No. 476,201

Int. Cl.[5] A47K *3/22*; E03D *9/08*

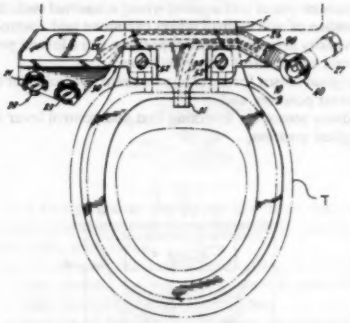
U.S. Cl. 4—448 **4 Claims**

1. A bidet accessory for installation in two-piece toilets having a flanged section in the rear and a bowl, and connected to hot and cold water supplies, comprising:

A. supporting means for holding bidet accessory in place having a substantially elongated shape and mounted to said rear flange and including an internal drainage channel, having two ends, within said supporting means and said drainage channel terminates on one end with a spout that extends over and inside said bowl;

B. valve means connected to said hot and cold water supplies for regulating the temperature of the water and including outlets through which said hot and cold water flows to a common outlet and said valve means being mounted to said supporting means and further including hot and cold water inlets connected to said hot and cold water supplies respectively;

C. flexible conduit means for routing the water having two ends and connected to said outlet at one of the ends;



D. sprayer means for directing the water connected at the other end of said conduit means wherein said sprayer means is hand held and is manually separable from said supporting means; and

E. means for holding said sprayer means and being connected to said support means and to the other end of said drainage channel so that any water remaining in said sprayer means runs down from said sprayer means to said means for holding said sprayer flowing through said drainage channel and into said bowl.

5,003,646

HYDROTHERAPY APPARATUS

Roger A. Stamp, Scappoose, Oreg., and Farrell D. Williams, Midland, Tex., assignors to Hydro Air Industries, Inc., Orange, Calif.

Filed Apr. 14, 1987, Ser. No. 38,046

Int. Cl.[5] A61H *33/02*

U.S. Cl. 4—542 **7 Claims**

2. A hydrotherapy apparatus for producing a rotating jet of water, comprising:

a supply port;

a water wheel fluidly coupled to said supply port whereby water introduced at said supply port rotatably drives said water wheel;

a nozzle connected to a circular plate at a point displaced from the center of said plate for producing a jet of water in a direction substantially perpendicular to said circular plate;

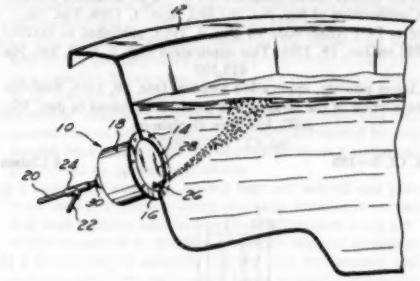
an elongate drive shaft supporting said circular plate;

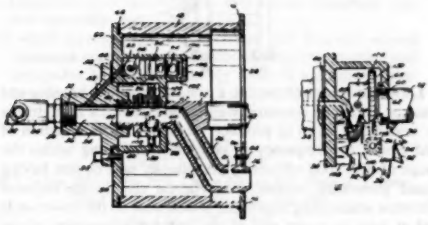
a coupler for coupling said water wheel to said drive shaft whereby rotation of said water wheel induces rotation of said nozzle at an extremely uniform angular rate, said angular rate being smaller than that of said water wheel;

a tub; and

a cylindrical housing, one end of which is secured to an interior wall of said tub, said circular plate substantially covering said end of said cylindrical housing yet permit-

ting fluid flow from said water wheel around said plate and into said tub, wherein said drive shaft is in fluid communication with the interior cylindrical wall of said cylindrical housing.



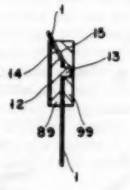


5,003,647

DISPOSABLE SHOWER LINER

James Williams, 12 Fred St., Burlington, Mass. 01803

Filed Jul. 24, 1989, Ser. No. 384,557
Int. Cl.[5] A47K *3/02*; E04F *13/08*
U.S. Cl. 4—559 **6 Claims**



4. A disposable shower liner kit comprising in combination

A a liner comprising

(a) a flexible substantially rectangular water impermeable sheet adapted to be removably placed over the walls of a shower,

(b) means at the beginning portion of the sheet for making openings in the sheet adapted to place the beginning portion over water handles and water spigots to contact the sheet against the shower wall, and

(c) a series of spaced apart apertures along the top portion of the liner,

B a magnetic fastening device comprising

(a) a wall mounting member

(i) having a back flat portion adapted for attachment to a shower wall

(ii) bearing a node directed forwardly of the member and

(iii) an upper front portion sloping upwardly toward the rear of the member

(b) an unmounted member for mating with the wall mounted member

(i) bearing an aperture to receive the protruding node on the wall mounting member, and

(ii) an upper portion sloping upwardly toward the mounted member to closely mate with the mounted member

(c) said wall mounting and unmounted members adapted to be magnetically attracted one to the other

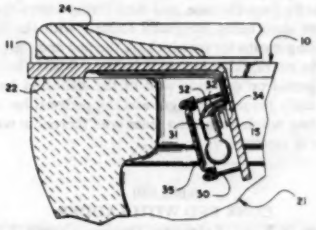
whereby when the wall mounting member is attached to the shower wall the shower liner apertures can be hung on its node and maintained securely as close as possible against the shower wall when the unmounted member is placed thereover.

5,003,648

LIGHT FOR TOILET BOWL

Alexander A. Anderson, 605 Antietam Dr., Stone Mountain, Ga. 30087

Filed Nov. 30, 1989, Ser. No. 443,168
Int. Cl.[5] A47K *17/02*; E03D *1/00*
U.S. Cl. 4—661 **5 Claims**



1. A light means for use on a toilet rim having front, back and opposite sides, said light means including a web shaped to overlie with the toilet rim from one side, across the back to the opposite side and being receivable on the toilet rim, said web having an outside edge outwardly of the rim and an inside edge inwardly of the rim, at least one holding flange depending from said outside edge of said web, and at least one light flange depending from said inside edge of said web, a light carried by said at least one light flange, and electrical circuit means for connecting said light to a source of power, said at least one holding flange including two holding flanges, one holding flange being located on each side of said web for holding said web in place on a toilet rim, said at least one light flange including two light flanges, one light flange being on each side of said web for lighting both sides of a toilet, and further including a housing at the rear apex of said web, switch means carried by said housing, and a power source in said housing for connection to said circuit means.

5,003,649

NESTABLE COT AND END CONNECTOR THEREFOR

Ray G. Kelly, Kirkwood, Mo., assignor to Angeles Nursery Toys, Inc., Pacific, Mo.

Filed Jan. 5, 1990, Ser. No. 461,326
Int. Cl.[5] A47C *19/00*
U.S. Cl. 5—8 **18 Claims**

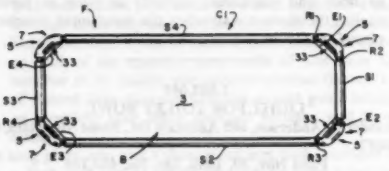
1. A nestable cot comprising:

a web of material on which an occupant of the cot can lay;

a frame to which the web of material is attached, said frame including a plurality of rods, one of which extends along each side of the web;

end connectors for connection to the respective ends of adjacent rods to interconnect the rods and complete the frame, each end connector including elongate housing means having a top and an opening at each end in which respective end of adjacent rods are received, each housing

means having an inner face thereof, support means for supporting the cot in an elevated position off the ground, said support means including a pedestal formed intermediate the length of the housing means and disposed inwardly from the inner face thereof, said pedestal from its top extending downwardly a distance sufficient to elevate the web of material off the ground, the height of the pedestal being greater than the distance between the top of the pedestal and the top of the housing means whereby the end connector means on one cot can fit upon the pedestal



of the end connector means of a subjacent cot, the pedestal is hollow and the cot further comprises pad means including a pad having the base and the stem extending upwardly from the base, said stem fitting within the pedestal, the stem being integrally formed with the base and including means for interlocking the pad and the pedestal, and the interlocking means including a flexible latch member formed on one side wall of the stem and having an outwardly projecting finger and the pedestal has a corresponding notch formed an inner wall thereof in which the finger is received.

5,003,650

BUNK BED WITH LADDER

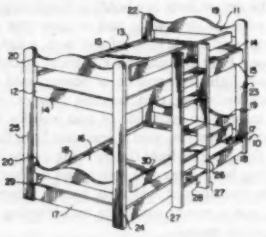
Mario Caya, R.R. #1, Pakenham, Ontario, Canada K0A 2X0

Filed May 8, 1990, Ser. No. 520,508

Claims priority, application Canada, Aug. 29, 1989, 609758

Int. Cl.[5] A47C *19/00*; A47D *7/00*

U.S. Cl. 5—9.1 **4 Claims**



1. An improvement in a bunk bed including a head board having a pair of spaced-apart legs and upper and lower transverse frames, a tail board having a pair of spaced-apart legs and upper and lower transverse frames and connecting members comprising a pair of transversely spaced-apart upper and lower longitudinally-extending outer frames having a generally rectangular cross section, the improvement comprising a bunk bed ladder comprising: a pair of spaced-apart upright stiles with a plurality of vertically-spaced-apart steps or rungs therebetween; an upper longitudinally-extending protective rail secured to the inner face of each of said stiles; a lower longitudinally-extending protective rail secured to the inner face of each of said stiles; and a pair or vertically-spaced-apart brackets secured to the inner face of each of said stiles, said brackets each including an upper portion contacting and fixedly-secured to an associated stile, and a lower portion spaced from its associated stile and adapted to be firmly-secured to a longitudinal outer frame member of a bunk bed.

5,003,651

CRIB WITH VIBRATION ATTENUATING MEANS

Karl G. Rosén, Karantänsgatan 13, S 442 35 Kungälv, Sweden

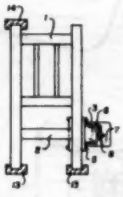
Continuation of Ser. No. 162,693, Mar. 1, 1988, Pat. No. filed as PCT SE85/0050 on Dec. 4, 1985, published as WO86/03388 on Jan. 19, 1986. This application Oct. 2, 1989, Ser. No. 415,599

Claims priority, application Sweden, Dec. 10, 1984, 8406250

The portion of the term of this patent subsequent to Jan. 16, 2007, has been disclaimed.

Int. Cl.[5] A47D *9/02*

U.S. Cl. 5—109 **4 Claims**



1. Device for attachment to a crib comprising a housing and a motor having an eccentric weight mounted on a shaft driven by said motor so as to produce vibrations upon actuation of said motor, the frequency of said vibrations being within the range of 800–2000 vibrations per minute, said device having sound generating means, and wherein the device includes vibration attenuating means for attachment to the lower ends and at least an upper end of the crib for attenuation of the vibrations that would be transmitted to the floor supporting the lower ends of the crib and the walls that could be contacting at least an upper end of the crib.

5,003,652

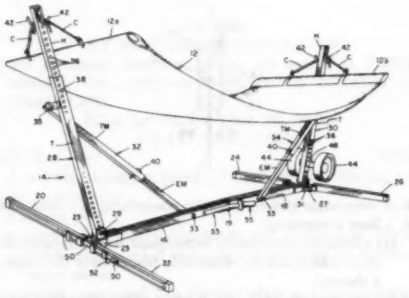
COLLAPSIBLE HAMMOCK

Lee Bayless, 611 N. Geneva, No. 139, Glendale, Calif. 91206

Filed Jan. 19, 1990, Ser. No. 467,503

Int. Cl.[5] A45F *3/24*

U.S. Cl. 5—129 **10 Claims**



1. A collapsible hammock assembly comprising:

(a) a hammock having first and second ends;

(b) first and second hingeably connected base members movable from a first collapsed positioned to a second extended, substantially in-line position;

(c) first and second stabilizing members hingeably connected to said first base member and movable from a first collapsed position wherein said members are disposed closely adjacent to said first base member to a second extended position wherein said members extend generally perpendicularly to said first base member;

(d) third and fourth stabilizing members hingeably connected to said second base member and movable from a

first collapsed position wherein said members are disposed closely adjacent to said second base member to a second extended position wherein said members extend generally perpendicularly to said second base member;

(e) a first hammock support assembly for supporting said first end of said hammock pivotally connected to said first base member for movement between a collapsed position to an operative position;

(f) a second hammock support assembly for supporting said second end of said hammock pivotally connected to said second base member for movement between a collapsed position to an operative position;

(g) a first brace assembly having first and second end portions, said first portion being pivotally connected to said first base member and said second end portion being pivotally connected to said first hammock support assembly;

(h) a second brace assembly having first and second end portions, said first end portion being pivotally connected to said second base member and said second end portion being pivotally connected to said second hammock support assembly; and

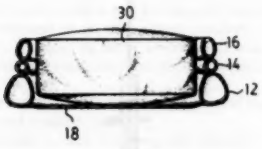
(i) wheel means connected to one of said first and second hammock support assemblies for rollably transporting said collapsible hammock assembly when in a collapsed configuration.

5,003,653

SEAT ASSEMBLY

Shih L. Mar, 5F-1, No. 212, Ching Hsing Rd., Taipei, Taiwan

Filed Aug. 9, 1990, Ser. No. 564,579
Int. Cl.[5] A47C *27/08*
U.S. Cl. 5—449 **1 Claim**



1. A seat assembly comprising generally an outer air cushion and inner air cushion provided therein; said outer air cushion including three rings superposed and fixed together, each ring having an air tap; a diameter of said lower ring, when taken in cross section, being larger than a diameter of said upper ring which is larger than a diameter of said middle ring; said inner air cushion being expanded and being limited within said outer air cushion when a user is seated thereon; and said inner air cushion completely absorbing a weight of said user and being deformed according to a body of said user so that said user may feel comfortable.

5,003,654

METHOD AND APPARATUS FOR ALTERNATING PRESSURE OF A LOW AIR LOSS PATIENT SUPPORT SYSTEM

John H. Vrzalik, San Antonio, Tex., assignor to Kinetic Concepts, Inc., San Antonio, Tex.

Continuation of Ser. No. 57,965, Jun. 1, 1987, abandoned, which is a continuation-in-part of Ser. No. 905,553, Sep. 9, 1986, abandoned, which is a continuation-in-part of Ser. No. 784,875, Oct. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 683,153, Dec. 17, 1984, abandoned. This application Sep. 28, 1988, Ser. No. 251,949
Int. Cl.[5] A61G *7/04*
U.S. Cl. 5—453 **29 Claims**

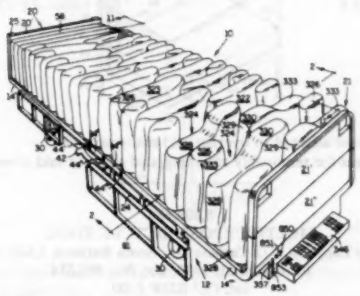
1. A patient support system comprising:

a frame means;

first and second sets of separately inflatable air bags for maintaining low interface pressures between the surface of the air bags and a patient supported on the top surface thereof, the air bags having varying shaped cutouts formed near one end of the top surface thereof, the air bags of said first set of air bags being mounted transversely to said frame means with the cutout closer to a first side of said frame means for receiving one side of the patient when the patient is rolled toward the first side of said frame means, and the air bags of said second set of air bags being mounted transversely to said frame means with the cutout closer to a second side of said frame means for receiving the other side of the patient when the patient is rolled toward the second side of said frame means;

means for selecting a base line pressure in the air bags of said first and second sets of air bags;

means for selecting first and second target pressures to which the air bags of each of said first and second sets of air bags are to be inflated; and



means for sensing the air pressure in the air bags of said first and second sets of air bags and comparing the air pressure in the air bags to the target pressure selected for each of said sets of air bags and, then, alternately inflating the air bags of said first set of air bags to the selected first target pressure when the air pressure in said first set of air bags is lower than the first target pressure selected for said first set of air bags to roll the patient toward the first side of said frame means when said first set of air bags is inflated and inflating the air bags of said second set of air bags to the second target pressure selected for said second set of air bags when the air pressure in said second set of air bags is lower than the second target pressure selected for said second set of air bags to roll the patient toward the second side of said frame means, thereby therapeutically inhibiting the formation and permitting the healing of bed sores and inhibiting the development of pulmonary congestion.

5,003,655

BED SHEET ASSEMBLY

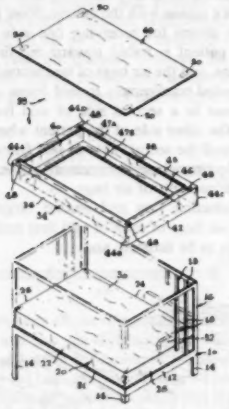
Malakeh B. Kafai, 17248 Van Gogh St., Granada Hills, Calif. 91344

Filed Feb. 16, 1990, Ser. No. 480,812
Int. Cl.[5] A47G *9/04*
U.S. Cl. 5—496 **7 Claims**

1. A bed sheet assembly for a mattress comprising:

a fitted peripheral edge cover having a peripheral side panel for covering the side of the mattress, said panel having upper and lower edge portions extending inward, said upper and lower edge portions for extending continuously about the peripheral edges of the top and bottom surfaces of the mattress when installed thereon, said inner ends of said upper and lower edge portions incorporating elasticized material at least about a portion thereof so as to

cause said upper and lower edge portions to gather together;



a sheet adapted to overlay said mattress; and

means for removably attaching said sheet to said cover.

5,003,656

MULTIPURPOSE BICYCLE TOOL

Duane Loppnow, 772 Casiano Dr., Santa Barbara, Calif. 93105

Filed Feb. 21, 1990, Ser. No. 482,514

Int. Cl.[5] B25F 1/00

U.S. Cl. 7—169 **19 Claims**

1. A multifunctional tool for use with bicycles, comprising:

a main body section;

a first means connected to said main body section for use in replacing a derailed bicycle chain; and

a second means connected to said main body section for use in removing at least one chain link of a bicycle chain;

said first means comprising a first projecting ear member extending from said main body section; said second means comprising a second projecting ear member extending from said main body section, and a third projecting ear member extending from said main body section;

said main body portion comprising an elongated member defining a front surface face, a rear surface face, a first side edge surface, and a second side edge surface, a first end and a second end; said first projecting ear extending from a first one of said surface; said second projecting ear extending from a second one of said surfaces; said third projecting ear also extending from said second one of said surfaces and spaced therealong from said second projecting ear;

said second projecting ear comprising a bent-member having a first section connected to said second one of said surface, and a second section connected to said first section and extending at an angle with respect thereto; said third projecting ear substantially lying in the same plane as said second section of said projecting ear for gripping links of a chain therebetween.

5,003,657

DEVICE FOR UNBLOCKING INTUBATION TUBES AND TRACHEOTOMY CANNULAS IN VIVO

Richard Boiteau, Paris; Denis Labayle, and Alain Tenaillon, both of L'Hay-les-Roses, all of France, assignors to Medipro, Paris, France

PCT No. PCT/FR88/00364, § 371 Date Mar. 6, 1989, § 102(e) Date Mar. 6, 1989, PCT Pub. No. WO89/00058, PCT Pub. Date Jan. 12, 1989

PCT Filed Jul. 8, 1988, Ser. No. 348,584

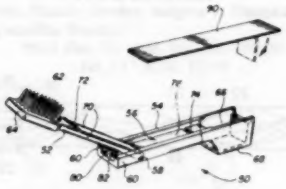
Claims priority, application France, Jul. 8, 1987, 87 09671

Int. Cl.[5] B08B 9/02

U.S. Cl. 15—104.33 **12 Claims**

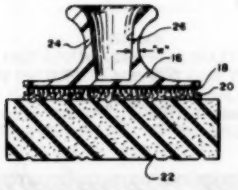
1. A device for preventing, by brushing, the blocking of intubation tubes in intubated patients or of tracheotomy cannulas in trachetomized patients, the device comprising first and second elements each having a distal end adapted to be introduced into an intubation tube or into a tracheotomy cannula, and a proximal end adapted to be controlled by an operator, said first element comprising a flexible central rod, the distal end of said rod being rounded, retractable tube/cannula cleaning means being disposed around the rod in the vicinity of the distal end thereof, said second element comprising a flexible tube in which said first element is received and slidably movable, the retractable tube/cannula cleaning means having a retracted configuration when received inside said second element and a deployed configuration when released from said second element for cooperation with walls of the intubation tube or the tracheotomy cannula, said device being adapted to be inserted by its distal end into the intubation tube or the tracheotomy cannula of the patient, said flexible tube being slidable relative to said rod to release said retractable tube/cannula cleaning means into its deployed configuration.

5,003,658
COMPACT SANITARY TOOTHBRUSH
Dennis A. Rolleri, 117 Center St., Nutley, N.J. 07110
Filed Nov. 3, 1988, Ser. No. 266,659
Int. Cl.[5] A46B *17/04*
U.S. Cl. 15—185 5 Claims



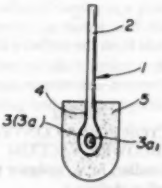
5. A compact toothbrush comprising:
a handle having a first handle section and a second handle section;
a brush end with bristles attached to said first handle section;
a protrusion with a reservoir forming a terminal end of said second handle section, said reservoir contoured to conform to said brush;
means for connecting and pivotally rotating said first handle section and said second handle section, said means positioned between said brush end and said terminal end and being so positioned that said reservoir will rotate to encompass said bristles;
a stop to limit said rotation such that said protrusion and said bristles are diametrically opposed in an open position, and said reservoir engages said bristles in a closed position;
a channel in said second handle section contoured to accept said first handle section and forming a planar surface when the toothbrush is in said closed position, said channel being rectangular in cross section and said first handle section having the same cross section as said cross section of said channel;
toothpaste in said reservoir and wherein said toothbrush is in said closed position; and
a seal attaching to and covering said channel.

5,003,659
CLEANING APPARATUS
Edwin E. Paepke, S3296 Fox Hill, Baraboo, Wis. 53913
Filed Dec. 5, 1988, Ser. No. 279,538
Int. Cl.[5] A47L *17/08*
U.S. Cl. 15—209 D 2 Claims



1. A kitchen utensil, comprising:
(a) a long-lasting, high impact, injection molded generally circular plastic handle which has a shaped side which is contoured with a circumferential, exterior, circular channel to receive at least part of a thumb and a finger of a human hand and which has a smooth surfaces frusto-conical central bore to receive removable means for extending said plastic handle, said plastic handle having one substantially flat surface which is located generally opposite to said shaped side, said removable means having an end with a smooth exterior which is adapted to frictionally fit within said bore, said end of said removable means having an inwardly tapered interior aperture and having almost vertical exterior walls; and
(b) a plurality of hook-like elements, adhesively carried by said flat surface of said handle, for removably attaching a cleaning head formed from a plurality of looped members which are adapted to be received by at least one of said hook-like elements.

5,003,660
COSMETIC APPLICATOR AND METHOD OF PRODUCING THE SAME
Osamu Oohinata, 40-13, Kameido 4-Cyome, Koutou-Ku, Tokyo-To, and Jun Yanagida, 38-16, Sugamo 5-cyome, Toshima-Ku, Tokyo-To, both of Japan
Filed Apr. 6, 1989, Ser. No. 334,216
Claims priority, application Japan, Apr. 8, 1988, 63-85229
Int. Cl.[5] A46B *15/00*
U.S. Cl. 15—244.1 8 Claims

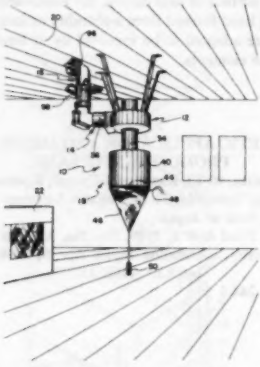


1. An applicator serving as a cosmetic accessory comprising:
(a) a core rod,
(b) a sponge portion serving as brushing means at one end of said core rod,
(c) disconnection preventive means molded integral with the core rod for preventing said brushing means from being disconnected from the core rod,
(d) said disconnection preventive means having thereon a coating of a rubber-dissolved solution, and,
(e) said sponge portion being integrated with the core rod by foaming, after a film of rubber provided by said coating of the rubber-dissolved solution is dried.

5,003,661
FORCED AIR APPARATUS FOR DIRECTING FILTERED AIR AGAINST A SURFACE
Merlin C. Wilson, Charlotte, N.C., assignor to Textile Air Company, Inc., Charlotte, N.C.
Filed Aug. 3, 1989, Ser. No. 388,999
Int. Cl.[5] A47L *5/14*
U.S. Cl. 15—301 11 Claims

1. An apparatus for directing air in a predetermined pattern to clean surfaces in the vicinity of textile machines by dislodging accumulated textile fibers, lint and other textile by-products therefrom, comprising:
a blower means for generating a stream of air;
means for supporting said blower means in a substantially fixed disposition relative to the surfaces to be cleaned;
first air directing means movable about an axis and communicated with said blower means for directing said air stream in a direction parallel to a plane during movement of said first air directing means about said axis;
means for moving said first air directing means about said axis; and
second air directing means for selectively changing the direction of said air stream relative to said plane, said second air directing means being movable in response to movement of said first air directing means about said axis,

whereby said air stream is directed in a predetermined pattern to dislodge accumulated fibers, lint and other



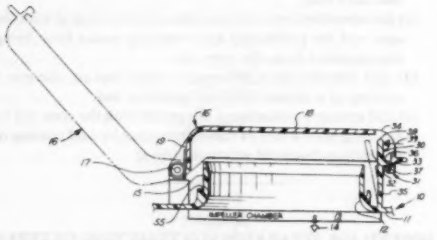
textile by-products from the surfaces in the vicinity of the textile machines.

5,003,662

CONNECTOR FOR A CONVERTIBLE BLOWER-VACUUM

Robert G. Everts, Chandler, Ariz., assignor to Inertia Dynamics Corporation, Chandler, Ariz.

Filed Dec. 15, 1989, Ser. No. 451,729
Int. Cl.[5] A47L *9/02*
U.S. Cl. 15—330 **6 Claims**



1. A connector for releasably connecting a vacuum pipe to the body of an implement convertible to a blower mode or to a vacuum mode, said body having an impeller chamber, and an intake port to the impeller chamber, said connector comprising:

a collar around said vacuum pipe, said collar having a plurality of receptacles which include passages therethrough, said receptacles being angularly spaced apart, a locking surface in each said passage, extending only partway along said passage, and an abutment aligned with said locking surface leaving a spacing between them; and

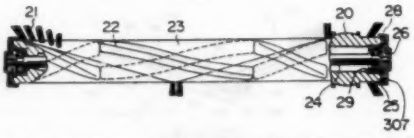
a plurality of stakes on said body each aligned with a respective passage, each stake having a locking face so disposed and arranged as to overhang said locking surface when aligned therewith, and a dimension of thickness substantially equal to said spacing, whereby with the collar angularly positioned with the passages alinged with the stakes and with the stakes to one side of the abutment and locking surfaces, the collar can be pressed against the body with the locking faces at a level above the locking surfaces, and the collar can then be turned to move the stakes into said spacing, thereby holding the stakes with their locking faces overhanging said locking surface to hold the vacuum pipe connected to the body.

5,003,663

UPRIGHT-TYPE ELECTRIC VACUUM CLEANER

Masao Sunagawa; Kazuhiro Kubota; Yoshitaro Ishii, all of Hitachi, and Susumu Satoh, Takahagi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 908,670, Sep. 17, 1986. This application Dec. 21, 1988, Ser. No. 287,157
Int. Cl.[5] A47L *5/30*
U.S. Cl. 15—366 **2 Claims**



1. An upright-type electric vacuum cleaner, comprising:

a main body case having an electrically-operated blower chamber, a bag compartment, and a dust filter accommodated in said bag compartment;

a suction port body tiltably supporting said main body case; and

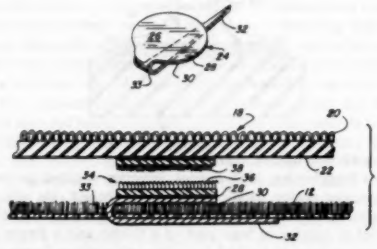
an electrically driven rotary brush accommodated in said suction port body, said rotary brush having around an outer periphery thereof spirally arranged bristles and at least a pair of integrally-formed spiral projections, said rotary brush having at all cross sections thereof perpendicular to an axis of said rotary brush a symmetrical configuration with respect to a center of said cross sections, each of said at least a pair of spiral projections being divided into a plurality of spiral pieces in a longitudinal direction of the rotary brush, said projections being provided on the front and rear of the outer periphery of the rotary brush as seen in a plan view taken perpendicular to the center axis of the brush and said projections being symmetrically disposed about the center axis of the brush, the cross-sectional configuration of said projections being such that no undercut portion exists between each projection and an adjacent peripheral portion of said rotary brush so that said rotary brush can be produced by a pair of molds mating in a plane which includes the axis of said rotary brush.

5,003,664

AUTOMOBILE MAT AND SECURING CLIP

Dorothy Y. Wong, 22W725 Elmwood Dr., Glen Ellyn, Ill. 60137

Filed Aug. 26, 1988, Ser. No. 236,795
Int. Cl.[5] A47G *27/04;* **B32B** *3/06, 7/08*
U.S. Cl. 16—6 **17 Claims**



12. A clip, comprising:

a main portion having first and second opposed sides;

a spike joined to said main portion and spaced from the second side of the main portion wherein the spike is capable of insertion into a carpet such that the spike underlies the carpet with the main portion exposed and the second

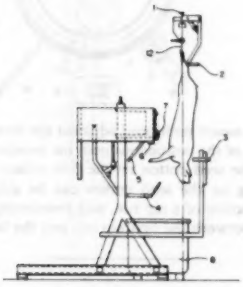
side of the main portion facing the carpet and such that the carpet is disposed between the spike and main portion; and means for allowing a mat to be secured to the first side of the main portion of the clip.

5,003,665

AUTOMATIC FRONT LEG CUTTER IN A TRANSPORT SLAUGHTERING LINE

Kjell Moritz, Skanör, Sweden, assignor to Skanska Slakterimaskiner, Tomelilla, Sweden

Filed Dec. 16, 1988, Ser. No. 285,256
Int. Cl.[5] A22C *13/00*
U.S. Cl. 452—185 **5 Claims**



1. Automatic front leg cutter in a slaughtering transport line comprising transporting means including a transporting hook for transporting an animal hanging by its hind legs in a slaughtering transport line, the animal constantly moving forward,

stabilizing means for stabilizing the animal including an air bar located close to the hind legs of the animal and a support bar against the neck of the animal,

a pair of lift arms for raising and lifting the front legs of the transported animal,

a plate for contacting and positioning the lifted front legs of the transported animal,

a pair of holders for fixing the positioned and lifted front legs,

cutter means including a pair of cutters for cutting off the fixed front legs and a drive therefor, and

sensitive antenna means activated when the automatic front leg cutter is to be operated whereupon responsive thereto the left arms raise and lift the front legs of an animal being transported by the transporting means, said plate contacts and positions the lifted front legs, said pair of holders fix the positioned and lifted front legs and the pair of cutters of the cutter means cut off the fixed front legs.

5,003,666

METHOD AND APPARATUS FOR MAKING STUFFED CASING PRODUCTS HAVING ONE FLAT END

Alan D. Stall, Naperville, and Vytas A. Randys, Chicago, both of Ill., assignors to Viskase Corporation, Chicago, Ill.

Filed May 29, 1990, Ser. No. 529,300
Int. Cl.[5] A22C *21/00*
U.S. Cl. 452—21 **24 Claims**

1. A method of producing stuffed products having one flat end comprising the steps of:

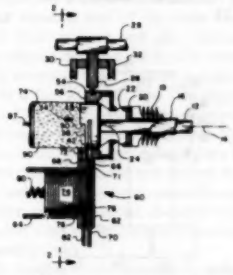
(a) locating a supply of casing to be stuffed on a stuffing horn and drawing a portion of the casing forward from the supply to locate a section of the casing forward of the stuffing horn;

(b) cutting a slit in said section of casing;

(c) inserting a disc having a flat face through said slit and into said section of casing and orienting said flat face substantially perpendicular to the longitudinal axis of the stuffing horn;

(d) drawing said section of casing forward relative to said disc to move said slit from said disc thereby locating said disc within an unbroken perimeter of casing and forming an intermediate longitudinal portion of said casing section between said slit and disc;

(e) gathering said intermediate portion of said casing section towards the longitudinal axis of the stuffing horn and then



closing the gathered casing at a position between said slit and disc thereby capturing said disc within said closed casing; and

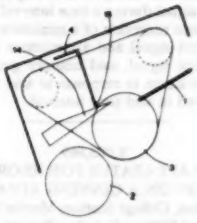
(f) stuffing a food product under pressure into said closed casing and against said disc to produce a stuffed product having a leading end defined by the flat face of said disc.

5,003,667

AUTOMATIC SKINNER FOR NON-SCALY FISH

Mario B. Alinovi, Parma, Italy, assignor to Omar S.a.c. di Mario Baiocchi Alinovi & C., Parma, Italy

Filed May 31, 1990, Ser. No. 531,284
Claims priority, application Italy, Oct. 18, 1989, 40153 A/89
Int. Cl.[5] A22B *5/16*
U.S. Cl. 452—125 **3 Claims**



1. An automatic skinner for non-scaly fish, comprising

a skinning roller (3);

a cleaning roller (2) disposed tangential to the skinning roller;

a blade (14), occupying a plane angled in relation to and directed down and away from the skinning roller;

a fish infeed surface (1), supported by a frame (12) that is angled in relation to a horizontal plane as if rotated about the axis of the skinning roller (3), such that the infeed surface (1) is inclined down toward the roller (3);

oscillating means that serve both to prevent jamming by assisting passage of the fish onto the skinning roller, and to cause the skinned fish to slide away toward a collection receptacle (11);

means by which to tilt the infeed surface support frame, the rollers, the blade and the oscillating means by rotating the support frame about a side of the infeed surface disposed normal to the axis of the skinning roller.

5,003,668

TEXTILE SPINNING MACHINE

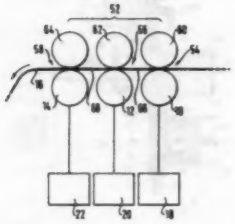
Urs Meyer, Niederglatt, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Jan. 9, 1990, Ser. No. 462,656

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1989, 3900409

Int. Cl.[5] D01G *31/00*

U.S. Cl. 19—0.22 15 Claims



1. A textile machine comprising

at least one drawing system having a plurality of runs forming at least one drawing section, one run of said system having a cylinder with a plurality of circumferentially disposed markings and a second run of said system having a cylinder with at least one marking thereon and being rotatable at a rotary speed different from said cylinder of said one run;

a first pulse generator for responding to said markings of said cylinder of said one run to generate a first output signal having a pulse repetition frequency corresponding to the speed and number of markings of said cylinder of said one run;

a second pulse generator for responding to said one marking on said cylinder of said second run to generate a second output signal having a pulse repetition frequency corresponding to the speed of said one marking; and

an electronic counter having a count input for receiving said first signal and a reset input for receiving said second signal, said counter being reset in response to reception of said second signal during a time interval corresponding to a time between reception of a minimum number of pulses from said first signal and a maximum number of pulses from said first signal, said counter generating a trigger signal for an alarm in response to said second signal not being received in said time interval.

5,003,669

METHOD AND APPARATUS FOR REORIENTING SEED COTTON ON A GINNING APPARATUS

Lambert H. Wilkes, College Station; Martin Mehner, Lubbock, both of Tex., and William F. Lalor, Raleigh, N.C., assignors to Cotton Incorporated, New York, N.Y.

Filed May 30, 1990, Ser. No. 530,808

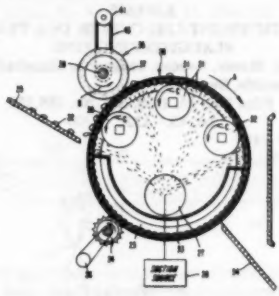
Int. Cl.[5] D01B *1/06*

U.S. Cl. 19—49 16 Claims

1. An apparatus for removing a fiber fraction from seed cotton, comprising:

a plurality of freely rotatable first rollers arranged substantially parallel to one another, said plurality of first rollers being rotatably driven in a continuous path, said continuous path having a first side for receiving the seed cotton and a second side opposite said first side;

a plurality of nip rolls, each of which has an outer peripheral surface that is positioned in abutting relation to the first rollers on the second side of the continuous path for nipping fiber fractions extending between adjacent first rollers, said plurality of nip rolls including a first nip roll which is located closer than the remaining nip rolls to a point at which seed cotton is initially deposited on the first side of the continuous path in the direction of movement of said plurality of first rollers, and a last nip roll which is located farther than the remaining nip rolls from the first nip roll in the direction of movement of the plurality of first rollers; and



reorienting means positioned adjacent the first rollers on the first side of the continuous path for reorienting the position of the seed cotton on the first rollers so that fibers remaining on the seed cotton can be subjected to the nipping action of a nip roll, said reorienting means being located between the first nip roll and the last nip roll.

5,003,670

APPARATUS FOR REDUCING THE STICKINESS OF COTTON FLOCKS

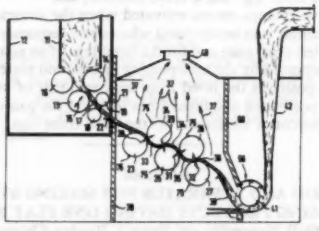
Rene Waeber, Winterthur; Robert Demuth, Nuerensdorf; Fritz Knabenhans, and Othmar Bachmann, both of Winterthur, all of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Division of Ser. No. 359,494, May 31, 1989, Pat. No. 4,969,234. This application Apr. 2, 1990, Ser. No. 503,511

Claims priority, application Switzerland, Jun. 3, 1988, 2120/88

Int. Cl.[5] D01B *5/08, 9/00*

U.S. Cl. 19—66 CC 21 Claims



1. An apparatus for reducing the stickiness of fibers of cotton flocks contaminated with honeydew, comprising:

a fiber feeding device by means of which the cotton flocks are compressed to form a fiber batt;

a plurality of heatable rolls;

said fiber batt having a predetermined direction of travel;

said fiber batt being fed to said plurality of heatable rolls;

fiber batt opening and fiber flock infeeding means, for subsequent processing of said fibers, arranged downstream of said plurality of heatable rolls as viewed in said predetermined direction of travel for receiving said fiber batt and for advancing opened fibers toward means for performing said subsequent processing of said fibers;

fiber conveyor means; and

said fiber batt opening and fiber flock infeeding means serv-

ing to open said fiber batt into loosened fiber flocks and transferring said fiber flocks to said fiber conveyor means.

5,003,671

DEVICE FOR AFFIXING THE STRAPS OF ARTICLES OF LUGGAGE

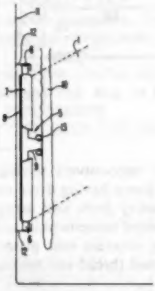
Andre Seynhaeve, Senlis, France, assignor to Delsey S. A., Bobigny, France

Filed Jan. 4, 1990, Ser. No. 459,994

Claims priority, application France, Jan. 11, 1989, 89 00257

Int. Cl.[5] A44C *5/18*

U.S. Cl. 24—265 A **7 Claims**



1. In an article of luggage having a peripheral lining defining a cavity for containing clothing and the like and including elastic straps selectively connected across the cavity for securing the clothing therein, an improved device for securing one end of a strap to the lining, the device comprising:

a generally planar plate having top, bottom and opposed side edges, each side edge including a plurality of spaced teeth extending in the plane of the plate;

a bracket fixed tot he lining and defining a space for fixedly receiving the plate, the bracket including opposed walls disposed to be engaged by the teeth on inserting the plate into the bracket; and

means on the plate for fixing the one end of the strap thereto.

5,003,672

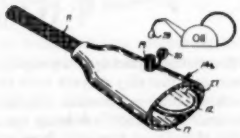
SHOCK CORD AND COVER ASSEMBLY

Ovid Randall, 9 E. Main St., Clifton Springs, N.Y. 14432

Filed May 24, 1990, Ser. No. 527,852

Int. Cl.[5] F16G *11/00*

U.S. Cl. 24—300 **1 Claim**



1. A shock cord and cover assembly comprising in combination,

a shock cord including an elongate elastomeric cord defined by a predetermined diameter, the elastomeric cord including a hook assembly fixedly mounted to at least one terminal end of the cord, the hook assembly defined by a predetermined length, the hook assembly further including a base fixedly secured to the elastomeric cord with a connecting leg extending upwardly from the base spaced from the elastomeric cord wherein the connecting leg terminates in a hook member directed downwardly projecting towards the base, and

a flexible cover housing, the flexible cover housing slidably mounted about the elastomeric cord to permit selective covering of the hook assembly, and

wherein the flexible cover housing includes a conical main body portion and a narrowed neck body portion defining a forward terminal end of the main body portion, the narrowed neck portion and the conical body portion coaxially aligned defining the flexible cover housing, and

wherein the narrowed neck portion includes a first opening defined by a first diameter, the first diameter is substantially equal to the predetermined diameter to effect surrounding engagement of the elastomeric cord, and

wherein the conical body portion includes a second opening, the second opening defined by a second diameter, the first diameter and second diameter coaxially aligned relative to one another with the second diameter substantially equal to or greater than a predetermined width defined by the hook assembly, and

wherein the flexible cover housing is defined by a cover housing length, the cover housing length equal to or greater than the predetermined length defined by the hook assembly, and

wherein the flexible cover housing includes a fluid absorbent sponge liner coextensively formed throughout an interior surface defined by the flexible cover housing, and

including a conduit directed through the main body portion of the cover housing in fluid communication with the liner, the conduit including a cap selectively securable overlying the conduit to permit directing of a lubricating fluid to the liner.

5,003,673

SNAP FASTENER

Bernhard Nysten, Aachen, Fed. Rep. of Germany, assignor to William Prym-Werke GmbH. & Co. KG, Stolberg, Fed. Rep. of Germany

Filed Jun. 5, 1990, Ser. No. 533,424

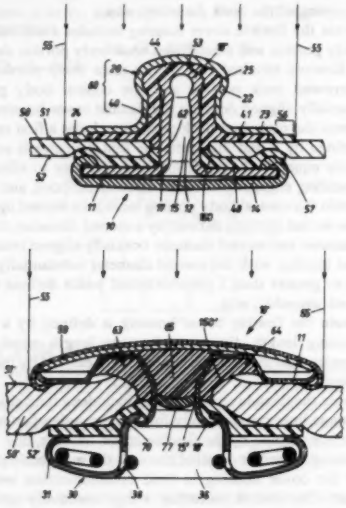
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1989, 3918375

Int. Cl.[5] A44B *17/00*

U.S. Cl. 24—662 **30 Claims**

1. A snap fastener comprising a male component including a male coupling element having an outer side, an inner side and a cavity with an inlet at said inner side, a first rivet having a deformable first shank extending into said cavity, and a liner at least a portion of which is disposed in said cavity between said male coupling element and said shank; and a female component including a female coupling element having a first side provided with a socket for said male coupling element and a second side provided with an opening in communication with

said socket, a second rivet having a deformable hollow second shank extending into said socket by way of said opening, and



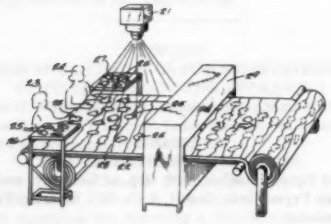
sealing means including a plug in said second shank and a sealing ring surrounding said second shank.

5,003,674

NEEDLE FELTED FABRICS

Samuel Cohen, 146 W. 57th St., New York, N.Y. 10019, and Liora G. Manne, 18 E. 18th St., New York, N.Y. 10003

Filed Aug. 2, 1989, Ser. No. 388,441
Int. Cl.[5] D04H *1/20*
U.S. Cl. 28—109 11 Claims



1. The process for producing improved needle-felted fabrics including,

providing a web of base fabric (**28**),

arranging colored fibers (**25**) on appropriate and corresponding places on a base fabric (**28**),

at least some fibers (A, B, C, D,) of one color overlapping some fibers A, B, C, D of another color, so that the colors will blend in the overlapped areas (A-B, B-C, C-D),

lightly securing the various-colored fibers (**25**) onto the base fabric (**28**) by pre-needling (**29**) with felting needles,

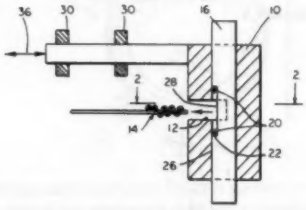
permanently securing the pre-needled (**29**) base fabric and colored fibers (**25**) by subsequent needling with fine gauge felting needles (**31**).

5,003,675

SEPARATOR FOR SEAMING MACHINES

Klaus Esser, and Hans-Eugen Hacker, both of Reutlingen, Fed. Rep. of Germany, assignors to Herman Wangner GmbH & Co. KG, Fed. Rep. of Germany

Filed Mar. 20, 1990, Ser. No. 495,963
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1989, 8903454
Int. Cl.[5] D03D *41/00, 3/04*
U.S. Cl. 28—141 6 Claims



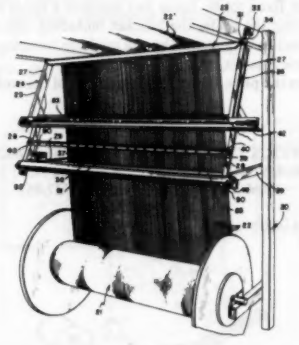
1. A separator for successively seizing threads held in an array, comprising a frame having drive means for moving the frame toward and away from said array, at least one plate having means for guided movement in said frame for seizing a thread in said array wherein said plate includes a piercing needle for piercing said thread and seizing said thread.

5,003,676

YARN END SPLICING APPARATUS

Sam M. McFalls, 1830 Beechwood Blvd., Gainesville, Ga. 30501

Filed Mar. 29, 1990, Ser. No. 500,929
Int. Cl.[5] D03J *1/18*; B65H *69/08*
U.S. Cl. 28—209 23 Claims



1. Apparatus for thermal splicing of a plurality of yarn ends from a fresh beam to a plurality of yarn ends severed from a spent beam in a carpet tufting apparatus, wherein each of said plurality of yarn ends from said fresh beam has an associated yarn end from said plurality of yarn ends from said spent beam said associated yarn ends forming a plurality of pairs of associated yarn ends, the apparatus comprising:

means for retaining said plurality of associated pairs of yarn ends in a spaced apart manner, said retaining means having means for holding a section of each of said associated pairs in contacting relation, said retaining means being of a predetermined width sufficient to retain all of said associated pairs simultaneously;

heating element means for heating said plurality of associated pairs of yarn ends to a temperature sufficient to melt said yarn ends in a substantially simultaneous manner, said

heating element means extending across substantially the entire width of said retaining means, said heating element means being disposed in a substantially stationary position relative to said retaining means and said associated pairs of yarn ends such that said contacting sections of said associated pairs of yarn ends will be heated and melted together by said heating element means.

5,003,677

METHOD AND APPARATUS FOR PROCESSING A TEXTURED YARN

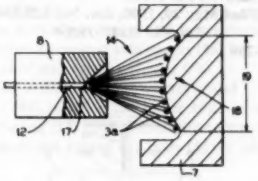
Eberhard Krenzer, Ennepetal-Ruggeberg, Fed. Rep. of Germany, assignor to Barmag AG, Remscheid, Fed. Rep. of Germany

Filed May 31, 1989, Ser. No. 359,101

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1988, 3818609; Jul. 15, 1988, 3824030

Int. Cl.[5] D06B *1/02*; D01D *5/22*; D02G *1/00*

U.S. Cl. 28—220 **19 Claims**



1. A method of processing a synthetic continuous filament yarn comprising the steps of

advancing the yarn along a path of travel,

guiding the advancing yarn across a fixed guide surface in a tensioned condition, while spreading the advancing yarn laterally as it is guided over the guide surface,

wetting the advancing yarn by directing a jet of liquid onto the yarn as it advances across the guide surface and from a direction generally opposing the guide surface, and

guiding the wetted yarn through an air texturing nozzle to impart bulk to the wetted yarn.

5,003,678

METHOD OF MAKING A CHANNEL SET RING

Suren Ogannesyan, 938 Mountain St., Glendale, Calif. 91207

Filed Jan. 22, 1990, Ser. No. 468,075

Int. Cl.[5] B23P *5/00*

U.S. Cl. 29—10 **7 Claims**

1. A method of making set ring comprising the steps of:

(a) forming a ring member having an outer cylindrical surface;

(b) forming a groove in the outer cylindrical surface of the ring mounting member, the groove extending at least partially around the circumference of the ring mounting member, and the groove defining a pair of upstanding rims, each having an upper end surface;

(c) machining a plurality of equidistantly spaced depressions in the bottom of the groove;

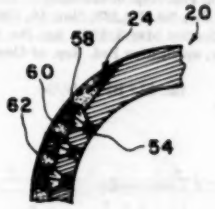
(d) drilling a setting hole centrally in each depression;

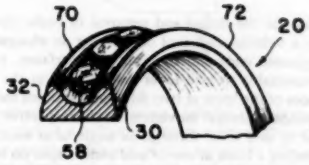
(e) placing a gem in each of the setting holes to obtain a desired orientation of the gems;

(f) applying a sheet of adhesive material to the upper end surfaces of the pair of upstanding rims and to a crown portion of the gems to the thereby hold the gems in place;

(g) rotating the ring mounting member while pressing a roller against the pair of rims, thereby toeing the rims inwardly into engagement with the gems;

(h) removing the sheet of adhesive material; and





(i) polishing the ring mounting member to form a desired final shape.

5,003,679

METHOD OF MANUFACTURING A DROPLET DEPOSITION APPARATUS

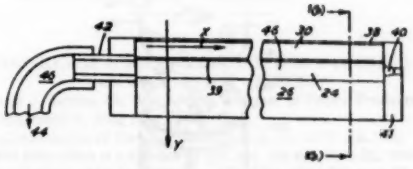
W. Scott Bartky, Chicago, Ill.; Anthony D. Patos; Stephen Temple, both of Cambridge, England, and A. John Michaelis, Glen Ellyn, Ill., assignors to XAAR Limited, Cambridge, United Kingdom

Division of Ser. No. 140,764, Jan. 4, 1988, Pat. No. 4,879,568. This application Sep. 1, 1989, Ser. No. 401,900

Claims priority, application United Kingdom, Jan. 10, 1987, 8700531; Jan. 10, 1987, 8700533

Int. Cl.[5] H01L *41/22*

U.S. Cl. 29—25.35 **12 Claims**



1. The method of making a multi-channel array pulsed droplet deposition apparatus, comprising the steps of

(a) forming a base wall with a layer of piezo-electric material

(b) forming a multiplicity of parallel grooves in said base wall which extend through said layer of piezo-electric material to afford walls of piezo-electric material between successive grooves, pairs of opposing walls defining between them respective liquid channels

(c) locating electrodes in relation to said walls so that an electric field can be applied to effect shear mode displacement of said walls transversely to said channels

(d) connecting electrical drive circuit means to said electrodes

(e) securing a top wall to said walls to close said liquid channels

(f) providing nozzles and liquid supply means for said liquid channels.

5,003,680

TOOL FOR FITTING AND REMOVING BRAKE SHOE RETURNS SPRINGS

Ivan Vesely, Holzkirchen, and Xaver Kreitmair, Dachau, both of Fed. Rep. of Germany, assignors to MAN Nutzfahrzeuge GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 274,188, Nov. 18, 1988, abandoned. This application May 8, 1990, Ser. No. 520,834

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1987, 3740465

Int. Cl.[5] B23P *19/04*

U.S. Cl. 29—227 16 Claims

1. A tool for the fitting and removal of brake shoe return springs in a vehicle, said tool comprising an elongated lever having opposite ends and opposite side surfaces, two draw hooks connectable to said lever respectively at the opposite side surfaces of the lever at two different locations for separate and independent pivotal movement about respective axes perpendicular to said lever through an angle of at least 90°, said lever including a hook at one of said ends, a spur on said lever, spaced from said hook and extending parallel to said hook, said hook and spur being selectively active to directly apply force to the brake shoe return springs, enabling said lever to act as a fulcrumed first and second class lever, said two draw hooks being of different lengths and disposed in planes parallel to said lever, means for selectively retaining the jaw hooks relative to said lever and handle means on said lever at the other end thereof extending perpendicularly to said lever.

5,003,681

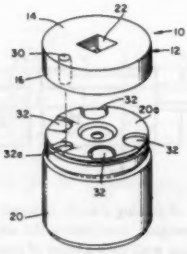
BRAKE TOOL

Paul E. Schley, 5511 E. Cerritos Dr., Orange, Calif. 92669

Continuation of Ser. No. 228,470, Aug. 5, 1988, abandoned, which is a continuation of Ser. No. 52,920, May 22, 1987, abandoned. This application Aug. 6, 1990, Ser. No. 579,337

Int. Cl.[5] B25B *13/06*

U.S. Cl. 29—239 1 Claim



1. In the installation of brake pads in automobiles wherein a brake piston is rotated, said brake piston having a generally flat planar face of a predetermined diameter and at least one shallow depression in the face,

(a) grasping the brake piston with a tool comprising

a cylindrical body member having a side wall and a flat planar working face at one end of the body member which abuts the flat planar face of the piston upon grasping the brake piston with the tool,

said working face being surrounded by an outwardly projecting rim which is an extension of the side wall, said rim being at right angle with respect to the working face and defining a surface area which is slightly greater than the area of the face of the piston and having a diameter slightly greater than the diameter of the face of the piston,

a central opening in the body member adapted to receive a device which, upon insertion into the opening and rotation thereof, coacts with the central opening to rotate the tool, and

a single pin extending outwardly from the working face at a right angle with respect to said flat planar working face and adapted to inserted into said one depression in the face of the piston, said pin, upon rotation of the tool, coacting with the rim, which grips the piston, to rotate the piston when the tool engages the piston, said working face being free of pins other than the single pin,

(b) aligning the single pin with said one depression and bringing the working face of the tool into abutting relationship with the planar face of the brake piston to insert the single pin into said one depression, and

(c) inserting the device into the central opening and rotating the tool to rotate the brake piston.

5,003,682

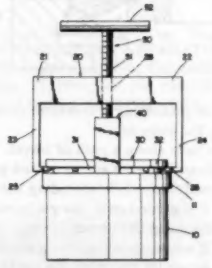
PLUG OR CAP PULLER

Dennis I. Strausbaugh, and Irvin R. Strausbaugh, both of R.D. 3, Box 306, Hanover, Pa. 17331

Filed May 29, 1990, Ser. No. 529,554

Int. Cl.[5] B23P *19/04*

U.S. Cl. 29—259 1 Claim



1. A tool means for removing a cap or plug (30) having a lid (32) from a sewer pipe assembly (10) having a widened gasket housing area (11) comprising,

a lower pushing assembly (40) having a central portion, a first lateral edge (41) and a second lateral edge (42),

a first vertical depending arm means (43) extending downwardly from said first lateral edge (41),

a second vertical depending arm means (44) extending downwardly from said second lateral edge (42),

wherein said first and second vertical depending arm means (43, 44) are fixedly formed as a part of said lateral edges (41, 42),

means (45, 46) wherein said lower pushing assembly (40) rests on the upper edge of said widened gasket housing (11),

an upper pulling assembly (20) having a central portion, a first lateral edge (21) and a second lateral edge (22),

wherein said central portion of the upper pulling assembly (20) has an aperture (28) formed therethrough,

a first vertical depending arm means (23) extending downwardly from said first lateral edge (21),

a second vertical depending arm means (24) extending downwardly from said second lateral edge (22),

wherein said first and second vertical depending arm means (23, 24) are fixedly formed as a part of said lateral edges (21, 22),

means (25, 26) wherein extended portions of said upper pulling assembly (20) are fit under the lid (32) of said cap or plug (30),

a screw assembly means (50) having a threaded cylinder (51)

means adapted for extending through said aperture (28) formed in said central portion of the upper pulling assembly (20),

handle means (52) attached to an upper portion of said threaded cylinder (51),

means wherein, upon clockwise rotation of said handle (52), a pushing force is exerted by said lower pushing assembly (40) on the upper edge of said widened gasket housing (11) and wherein a pulling force is exerted by said upper pulling assembly (20) on the underside of the plug lid (32) wherein said plug is removed from said sewer pipe assembly (10),

wherein said means (45, 46) by which said lower pushing assembly (40) rests on the upper edge of said widened gasket housing (11) comprise arms inwardly horizontally extending from said vertical depending arms (43, 44), said means (45, 46) being formed as a unitary construction with said arms (43, 44),

wherein said means (25, 26) by which said upper pulling assembly (20) is fitted under the lid (32) of said cap or plug (30) comprise arms (25, 26) inwardly extending horizontally from said vertical depending arms (23, 24), said means (25, 26) being formed as a unitary construction with said arms (23, 24),

wherein the central portion of said lower pushing assembly (40) includes a recessed area means (48) for receipt of the lower end of said screw cylinder (51),

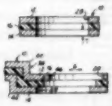
wherein said means (45, 46) whereby said lower pushing assembly (40) rests on the upper edge of said widened gasket housing (11) comprise shortened arm elements (45, 46) which do not extend to a body (31) of said cap or plug (30).

5,003,683

FORMING BORES IN BENDABLE LAYERED MATERIALS

Cornell Candea, Clawson, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 11, 1989, Ser. No. 448,381
Int. Cl.[5] B23P *17/00*
U.S. Cl. 29—425 **2 Claims**



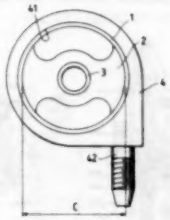
1. A method of forming an opening in layered sheet material to be subsequently bent by which the layers are shifted relative to one another in a direction normal to the bend, so that a port-bend circular opening with a desired radius is finally produced to receive a cylindrical fastener, comprising: piercing the layered material thereby forming an oblong pre-bend opening which has circular end configurations each with a center point and substantially the same shape as the desired post-bend circular opening, a line extending through the center points of the circular end configurations being aligned in a direction normal to the subsequent bend and with the center points spaced from one another a distance related to the shift caused by the bend bending the layered material along a line substantially normal to a line through the center points of the end configurations, thereby shifting the layers relative to one another in the direction normal to the bend sufficiently so that opposite end configurations in different layers move toward one another a circular opening through the shifted layered material.

5,003,684

METHOD OF MANUFACTURING TUBULAR VIBRATION-INSULATING BUSHING

Masaki Inoue, Aichi, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Sep. 27, 1989, Ser. No. 413,239
Claims priority, application Japan, Nov. 29, 1988, 63-301318
Int. Cl.[5] B23P *11/02*
U.S. Cl. 29—447 **6 Claims**



1. A method of manufacturing a tubular vibration-insulating bushing including a cylindrical outer tube; a vibration-insulating rubber member disposed within said outer tube, extending lengthwise along said outer tube, and extending widthwise transversely of said outer tube in such a manner that opposite lateral sides of said rubber member are connected to an inner peripheral surface of said outer tube; and an inner tube embedded in and extending through a central portion of said rubber member in coaxial relation to said outer tube; and mounting the same to a holder bracket,

said member comprising the steps of:

forming an outer tube from a resilient material;

placing said outer tube in a mold in such a manner that said outer tube is resiliently deformed into an oval cross-section;

pouring a molding material into said outer tube to mold a vibration-insulating rubber member so as to form the bushing, said rubber member extending widthwise along the greatest diameter of said outer tube;

subsequently removing the bushing from said mold; and

subsequently press-fitting said outer tube into a cross-sectionally circular bore of a holder bracket while deforming said outer tube into a circular cross-section, thereby fixing said outer tube relative to said bracket.

5,003,685

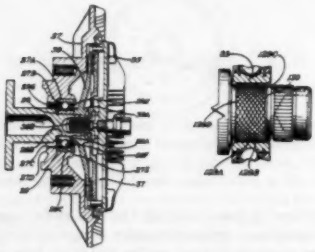
METHOD OF MAKING A CLUTCH FOR A COOLING FAN OF A MOTOR VEHICLE

David J. Settles, Ft. Worth, Tex., assignor to Dayco Products-Eaglemotive, Inc., Fort Worth, Tex.

Continuation of Ser. No. 260,627, Oct. 21, 1988, Pat. No. 4,899,863, which is a division of Ser. No. 158,413, Feb. 22, 1988, abandoned, which is a division of Ser. No. 895,976, Aug. 12, 1986, Pat. No. 4,741,091. This application Nov. 22, 1989, Ser. No. 440,572
The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.
Int. Cl.[5] F16D *35/00*
U.S. Cl. 29—525 **4 Claims**

1. In a method of making a clutch for a cooling fan of a motor vehicle, said clutch comprising a shaft having a first end to be attached to a rotatable member of the motor vehicle and having a second end defined by a cylindrically shaped knurled portion and an adjacent second portion, said knurled portion having protuberances defined by slots formed in the exterior of said shaft, said knurled portion having an outer diameter and having an inner edge adjacent said second portion and an outer edge adjacent said first end, a bearing means having an inner race member press-fitted onto said knurled portion, a housing comprising a body member and a plate member secured to-

gether to form an enclosed chamber for holding a viscous fluid, said housing having means for mounting a fan, said body member having a central opening defined by structural means, said bearing means being disposed in said central opening of said body member and engaging said structural means such that said bearing means supports said body member and hence said housing for rotation, and a drive plate having a central opening defined by inner structure press-fitted onto said second portion of said shaft, the improvement comprising the steps of forming said shaft before using said shaft to form said clutch with a solid ring shaped portion between said knurled portion and



said second portion and next to said inner edge of said knurled portion, forming said solid ring shaped portion to have an outer diameter about equal to that of said outer diameter of said knurled portion by burnishing said protuberances and said solid ring shaped portion to about the same diameter before said bearing means is press-fitted thereon, and then press-fitting said bearing means on said knurled portion of said shaft so that part of said inner race member of said bearing means remains press-fitted on said solid ring shaped portion whereby said solid ring shaped portion is adapted to block the flow of said viscous fluid out of said enclosed chamber by way of said slots which define said protuberances of said knurled portion.

5,003,686

METHOD OF MANUFACTURING A SYNCHRONOUS ELECTRIC MOTOR WITH MAGNETISED ROTAR

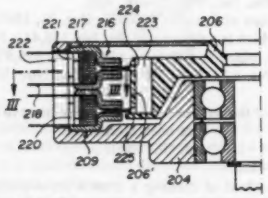
Claude Oudet, Besancon; Gilbert Drey, La Chaux-De-Fonds, and Norbert Veignat, Besancon, all of France, assignors to Portescap, Chaux-DeFonds, Switzerland

Division of Ser. No. 117,200, Aug. 6, 1987, Pat. No. 4,866,323. This application Jul. 3, 1989, Ser. No. 376,174

Claims priority, application Switzerland, Dec. 6, 1985, 5192/85

Int. Cl.[5] H02K *15/02*

U.S. Cl. 29—596 **12 Claims**



1. A method of manufacturing a synchronous electric motor comprising at least one rotor part of an essentially flat annular form, magnetized in such manner as to present at least one series of magnetic pole, disposed regularly along a flat annular zone, the rotor part being fixed by means of at least one rotor-supporting part on a shaft of the motor mounted so as to be rotatable with respect to at least one stator assembly, the stator assembly comprising at least two stator parts of a magnetically permeable material, forming a variable air-gap along at least a portion of an annular space in which are disposed the magnetic poles of the rotor part, the stator assembly also comprising at least one electric control coil coupled with one or more of said pole parts, wherein the fixing of the rotor part on the rotor-supporting part is achieved in such a way as to permit, at the time of assembly the motor, a positioning of the rotor part in the axial direction and also an angular positioning of the rotor part about the direction of the shaft of the motor comprising the steps of:

first fitting the motor shaft with the rotor-supporting part;

assembling the shaft with the fitted rotor-supporting part with an assembly of pole parts which have to be disposed facing a corresponding flat annular zone of the respective rotor part, in such manner that the ends of these pole parts, in the axial direction, are disposed in a plane perpendicular to the axis of the motor shaft;

placing the annular rotor part in position by disposing at least one spacer element of determined thickness between the rotor part and the ends of at least one portion of the said pole parts;

fixing the rotor part on the rotor support; and

then withdrawing or removing the spacer element from the space between the rotor part end the said pole parts.

5,003,687

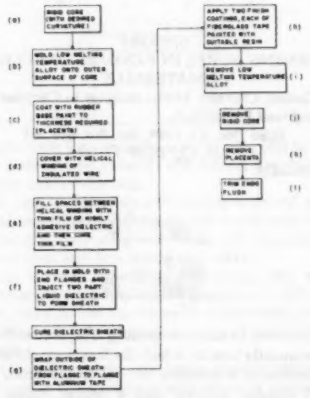
OVERMODED WAVEGUIDE ELBOW AND FABRICATION PROCESS

Roger H. Lapp, Silver Spring, and Theodore F. Paraska, Clarksville, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed May 16, 1988, Ser. No. 194,364

Int. Cl.[5] H01P *11/00*

U.S. Cl. 29—600 **13 Claims**



1. A method for fabricating a circular waveguide elbow section comprising the steps of:

providing a removable rigid core form having the elbow curvature desired;

coating said core form with a low melt temperature material;

applying a helical winding of insulated wire onto the outer surface of the coated core form;

molding a lining of dielectric material onto the outer surface of said helical winding;

attaching an electrically conductive layer to encapsulate the outer surface of said dielectric lining; and

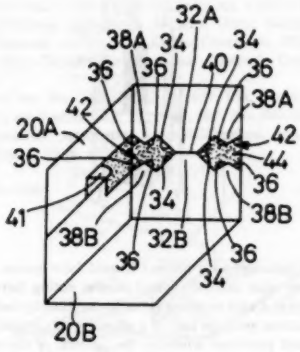
withdrawing said rigid core form by melting said low melt temperature material by applying heat to said low melt temperature material to release said core form from said winding.

5,003,688

METHOD OF PRODUCING A MAGNETIC HEAD CORE HAVING TRACK-WIDTH DEFINING CUT OUTS FORMED ON OPPOSITE SIDES OF A MAGNETIC GAP

Nobuhiro Tersda, Kasugai; Masataka Shimizu, Inuyama, and Soichiro Matsuzawa, Kuwana, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed May 15, 1989, Ser. No. 352,291
Claims priority, application Japan, May 17, 1988, 63-119768
Int. Cl.[5] G11B 5/42
U.S. Cl. 29—603 4 Claims



1. A method of producing a magnetic head core including two ferrite blocks which are bonded together so as to form a magnetic path, said two ferrite blocks having opposed surfaces and comprising respective two protrusions which protrude from respective portions of said opposed surfaces and have opposed end faces cooperating with each other to define a magnetic gap therebetween, said opposed surfaces of said two ferrite blocks cooperating with said two protrusions, to define two cutouts formed on opposite sides of said magnetic gap, such that a spacing provided between said opposed surfaces by each of said two cutouts is larger than said magnetic gap between said end faces, said cutouts defining an effective width of a track of the head core in which said magnetic gap is open, said method comprising the steps of:

preparing two ferrite blanks corresponding to said two ferrite blocks, each of said two ferrite blanks having opposed major surfaces;

forming a patterned etching mask on one of opposed major surfaces of said each ferrite blank, said patterned etching mask comprising a relatively wide resist portion corresponding to the corresponding one of said two protrusions, and at least two relatively narrow resist portions corresponding to said two cutouts;

subjecting said one of the opposed major surfaces of said each ferrite blank to an etching operation through said patterned etching mask, to form a corresponding one of said two protrusions and at least one ridge formed on each side of said corresponding one protrusion, such that said corresponding one protrusion has two side surfaces each of which is inclined at an angle of 25°–75° with respect to said end faces defining said magnetic gap; and

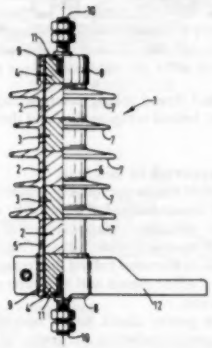
bonding together said two ferrite blanks such that the opposed end faces of the two protrusions formed on the etched surfaces of said two ferrite blanks define said magnetic gap therebetween, while said at least one ridge formed one each side of one of said two protrusions cooperates with said at least one ridge formed one each side of the other protrusion, to define said two cutouts.

5,003,689

METHOD AND APPARATUS FOR MANUFACTURING A SURGE ARRESTER

Rodney M. Doone, and Henry J. Colbert, both of Burgess Hill, England, assignors to Bowthorpe EMP Limited, Brighton, England

Continuation of Ser. No. 366,842, Jun. 15, 1989, abandoned, which is a division of Ser. No. 924,486, Oct. 29, 1986, Pat. No. 4,851,955. This application Mar. 5, 1990, Ser. No. 489,862
Claims priority, application United Kingdom, Jan. 29, 1986, 8602112
Int. Cl.[5] H01C 17/02
U.S. Cl. 29—613 9 Claims



8. A method of manufacturing a surge arrester comprising the steps of

(a) assembling terminal blocks, varister blocks and electrically conductive heat sink/spacer blocks in face-to-face contact in a distributed array;

(b) applying forces to said terminal blocks so as to compress together all of the blocks in said array;

(c) while maintaining said blocks in said array, enwrapaping said array of blocks with a pre-preg material of a reinforced rigid plastic material;

(d) curing said plastic material in said pre-preg under mold pressure and evacuation so as to bring said plastic material into intimate bond contact with said blocks free of gaseous entrapments and voids and to encase said blocks within a rigid shell bonded to peripheral surfaces of said blocks, thereby forming a core of encased blocks; and,

(e) introducing said core within a shedded sleeve of mechanically released elastomeric material with a fluid weather-proof sealant therebetween.

9. A method of manufacturing a surge arrester comprising the steps of

(a) assembling terminal blocks and varistor blocks in face-to-face contact in a distributed array;

(b) applying forces to said terminal blocks so as to compress together all of the blocks in said array;

(c) while maintaining said blocks in said array, enwrapping said array of blocks with a pre-preg material of a reinforced rigid plastic material;

(d) curing said plastic material in said pre-preg under mold pressure and evacuation so as to bring said plastic material into intimate bond contact with said blocks free of gaseous entrapments and voids and to encase said blocks within a rigid shell bonded to peripheral surfaces of said block, thereby forming a core of encased blocks;

(e) introducing said core within a shedded sleeve of polymeric heat-shrink material with a fluid weather-proof sealant therebetween; and

(f) applying heat to shrink said sleeve of heat-shrink material onto said core in an evacuated chamber so as to avoid

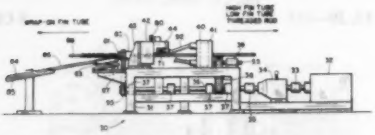
gaseous entrapments and voids between said core and said shrunk sleeve.

5,003,690

FINNING AND THREAD ROLLING MACHINE

Ray C. Anderson, 7605 S. Quebec, Tulsa, Okla. 74136

Filed Sep. 9, 1988, Ser. No. 242,291
Int. Cl.[5] B23P *15/26*
U.S. Cl. 29—727 2 Claims



1. A finning and thread rolling machine capable of producing extruded fins, helical wrap-on fins, and threaded rod or bar comprising:

(a) a base;

(b) a motor supported by said base;

(c) a drive system means operatively powered by said motor including a transmission for selectively engaging, disengaging and reversing rotational power to a thru-hole power chuck means, to a plurality of finning discs, smooth drive wheels or threaded rolling dies rotatably mounted to a plurality of arbor means and to a tube guide with pressure roll means;

(d) a thru-hole power chuck means operatively driven by said drive system including a plurality of individual jaws for accepting feed stock material therethrough during finning, helical wrapping or threading of said feed stock material wherein each individual jaw of said thru-hole power chuck means attaches to and simultaneously advances, holds stationary or withdraws a plurality or arbor blocks radially about said feed stock material;

(e) a plurality of arbor blocks with rotationally powered arbor means operatively driven by said drive system wherein each arbor block with arbor means is operatively attached to one of said jaws of said thru-hole power chuck means and wherein each of said arbor means further comprise a rotatable tool that can be advanced towards, held in contact with or withdrawn from said feed stock material during the finning, helical wrapping or threading of said feed stock material, said rotatable tool being selected from the group consisting of finning disc, smooth drive wheel and threaded rolling die; and

(f) a tube guide with pressure roll means operatively driven by said drive system for selectively wrapping a helical spiral strip on to said feed stock material.

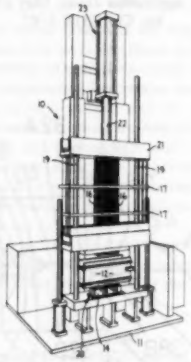
5,003,691

MECHANICAL TUBE EXPANDER WITH HAIRPIN BEND SUPPORT

James G. Milliman, and Lawrence A. Franks, both of Sturgis, Mich., assignors to Burr Oak Tool & Gauge Company, Sturgis, Mich.

Filed Jul. 6, 1990, Ser. No. 549,455
Int. Cl.[5] B23P *15/26*
U.S. Cl. 29—727 18 Claims

1. In a mechanical tube expander for expanding hairpin tubes into interlocked relationship with fins, comprising a frame, means for holding on said frame an assembly of fins loosely stacked on hairpin tubes, a receiver mounted on said frame and adapted for supporting the bent portions of said hairpin tubes, a pressure plate carrying a plurality of expander rods which are aligned with the tubes, said expander rods having tube-expanding means at one end thereof and means for reciprocating said expander rods with respect to said assembly in order to expand the tubes into interlocked relationship with the fins that are stacked thereon, the improvement which comprises: said receiver comprises base means; a plurality of upright, elongated, parallel, adjacent receiver posts extending upwardly from said base means, each of said receiver posts having a cavity in its upper end for receiving a portion of the hairpin bend of a hairpin tube; means supporting each of said receiver posts for



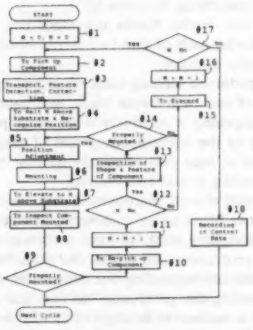
individual rotation with respect to said base means about the longitudinal axis thereof; detent means acting between said base means and said receiver posts for releasably locking each of said receiver posts in one of a plurality of circumferentially spaced-apart positions whereby the pattern of the cavities in the upper ends of said receiver posts can be changed by individually rotating said receiver posts.

5,003,692

ELECTRIC COMPONENT MOUNTING METHOD

Yasuo Izumi, Ikoma; Kazumi Ishimoto, Katano, and Yutaka Makino, Kobe, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 16, 1990, Ser. No. 524,055
Claims priority, application Japan, May 17, 1989, 1-123221
Int. Cl.[5] H05K *3/30*
U.S. Cl. 29—834 3 Claims



1. A component mounting method which comprises the steps of:

recognizing the position of an electric component retained by a suction nozzle by the effect of a suction force;

recognizing the predetermined mounting position on a support medium such as, for example, a printed circuit board or any other suitable substrate, at a location spaced a predetermined distance from the support medium;

mounting the electric component after the latter has been aligned with the predetermined mounting position on the support medium;

recognizing, through the suction nozzle, the electric component to determine if the electric component has been mounted properly after the suction nozzle has been elevated to a position spaced a predetermined distance upwardly from the support medium; and

recording in a control data information indicative of an incorrect mounting of the electric component in the event that the latter has been mounted incorrectly.

5,003,693

MANUFACTURE OF ELECTRICAL CIRCUITS

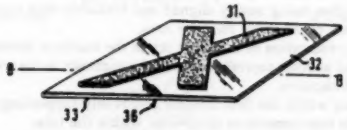
Anthony Atkinson, Gateshead; Richard Gray, South Shields, both of England, and Oscar L. Denes, Greendale, Wis., assignors to Allen-Bradley International Limited, Oxfordshire, England

Division of Ser. No. 71,267, Jul. 1, 1987, Pat. No. 4,912,288. This application Sep. 11, 1989, Ser. No. 443,402

Claims priority, application United Kingdom, Sep. 4, 1985, 8612116; Sep. 3, 1986, 8522003

Int. Cl.[5] H05K *1/00*

U.S. Cl. 29—849 **20 Claims**



1. A method of providing an electrical circuit in a three-dimensionally shaped surface of insulating plastics material, comprising the sequential or non-sequential steps of:

(i) providing a carrier, which is a film of insulating plastics material, with a circuit pattern of electro-conductive or electro-resistive, heat-resistant synthetic resin applied to at least one face thereof;

(ii) supporting a face of the carrier;

(ii) forming the patterned carrier into a given three-dimensional shape; and

(iv) moulding, by the application of heat and pressure, a substrate of insulating plastics material against the unsupported face of the carrier;

so that the circuit is embedded in a surface of the moulded substrate forming the three-dimensional surface.

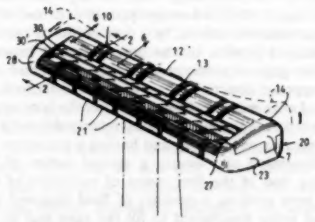
5,003,694

FLEXIBLE RAZOR HEAD

Evan N. Chen, Fairfield, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 353,840, May 18, 1989, which is a continuation of Ser. No. 115,781, Oct. 30, 1987, Pat. No. 4,854,043. This application Apr. 10, 1990, Ser. No. 507,272

U.S. Cl. 30—49 **47 Claims**



1. A flexible razor head comprising:

a cap;

at least one blade;

a seat;

means for securing said cap, blade and seat;

said seat comprising at least one corrugation with a sidewall;

said sidewall having an upper portion, a generally central portion and a lower portion; and

wherein said central portion has a different width than said upper and lower portions.

5,003,695

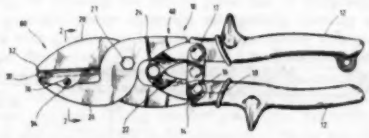
COMPOUND ACTION ANVIL SNIPS

Dennis E. Lipscomb; Gary L. Wilhelm; Barbara G. Perna, and Waldemar G. Guenthner, all of Statesboro, Ga., assignors to Cooper Industries, Inc., Houston, Tex.

Continuation of Ser. No. 353,199, May 15, 1989, abandoned, which is a continuation of Ser. No. 182,268, Apr. 15, 1988, abandoned. This application Mar. 13, 1990, Ser. No. 494,924

Int. Cl.[5] B26B *17/00*

U.S. Cl. 30—193 **31 Claims**



1. Cutting snips comprising:

a pair of handles;

a pair of cutting blades pivotally connected to each other and to said handles such that a squeeze force on said handles is converted into a closing force for said pair of blades;

an anvil member disposed on the edge of one of the blades in a position to be engaged by the other blade when the blades are closed;

means pivotally attaching said anvil member to said one of said blades so that in use, when engaged by the other blade, the anvil member is pivoted to a position parallel to the other blade;

whereby the cutting snips cut a workpiece such that a smooth or non-jagged edge is provided on the workpiece.

5,003,696

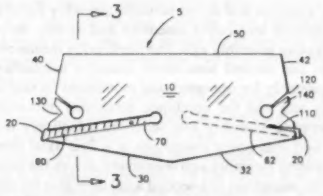
UTILITY KNIFE WITH OPPOSING BLADES

Eli G. Spehar, 19441 Perch Cir., Huntington Beach, Calif. 92646

Filed Jul. 5, 1989, Ser. No. 375,866

Int. Cl.[5] B26B *3/00*

U.S. Cl. 30—299 **4 Claims**



1. A utility knife comprising a pair of cutting blades and a flat plate, said flat plate comprising a front and rear planar faces having left and right guide edges, left and right sides, left and right blade holder means and a top edge, said left and right blade holder means each having an upper and a lower side for supporting therebetween, in compression, one said cutting blade, said left and right side edges, each containing a lever for adjustment of said compression force, said left and right guide

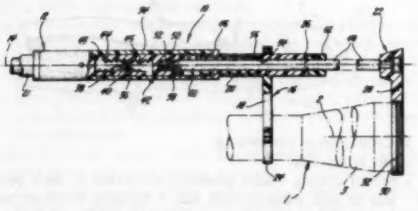
edges, together forming the lower extremity of said flat plate, joined at an interior angle of approximately 160 degrees; whereby said blades protrude from said left and right side edges, in opposition, for cutting a material for cutting while moving said left or, alternately, said right guide surface against said material for cutting.

5,003,697

TELESCOPIC SIGHT LENS PROTECTOR

William B. Hampton, 3659 Glennie Rd., Glennie, Mich. 48737, assignor to William B. Hampton and Jeanne M. Hampton, Glennie, Mich.

Filed Dec. 4, 1989, Ser. No. 445,465
Int. Cl.[5] F41G 1/04, 11/00
U.S. Cl. 33—244 11 Claims



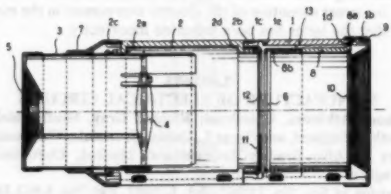
1. A lens protector for a telescopic sight having first and second ends defined by an axis comprising, in combination, a lens cover operating assembly defined by an operating assembly axis substantially parallel to said sight axis; attachment means for fixedly attaching said lens cover operating assembly to said sight so that said lens cover operating assembly is rotatable about said operating assembly axis; a first lens cover assembly fixedly secured to a first end of said lens cover operating assembly for selectively covering said first sight end; and a second lens cover assembly fixedly secured to a second end of said lens cover operating assembly for selectively covering said second sight end, rotation of said lens cover operating assembly about said operating assembly axis selectively moving said lens cover assemblies from closed to open positions relative to said sight ends; said lens cover operating assembly including a rotation and linear motion imparting pinion assembly fixedly positioned on said operating assembly axis, a first lens cover actuator assembly fixedly secured to said first lens cover assembly and axially movable on said operating assembly axis, a second lens cover actuator assembly fixedly secured to said second lens cover assembly and axially moveable on said operating assembly axis, and connection means connecting said first and second lens cover actuator assemblies to said pinion assembly for opposite axial movement on said operating assembly axis and for combined rotational movement about said operating assembly axis whereby selectively moving either of said lens cover assemblies in a first axial direction on said operating assembly axis selectively moves the other of said lens cover assemblies in a second axial direction on said operating assembly axis opposite said first axial direction and selectively rotating either of said lens cover assemblies a predetermined angle about said operating assembly axis selectively rotates the other of said lens cover assemblies said predetermined angle in the same direction about said operating assembly axis so as to simultaneously cover and uncover said sight ends and simultaneously rotate said lens cover assemblies in the same angular direction.

5,003,698

APPARATUS FOR VIEWING A REPRESENTATION OF THE CELESTIAL VAULT

Bernard Vuarnesson, 1 Blvd. St. Michel, 75006 Paris, France

Filed May 1, 1990, Ser. No. 517,302
Claims priority, application France, May 5, 1989, 89 05996
Int. Cl.[5] G01C 17/34
U.S. Cl. 33—268 14 Claims



1. Apparatus for viewing a representation of the celestial vault comprising:

a first tube and a second tube,

one of the tubes bearing along a periphery of its outer face a scale of graduations in days of a year,

the other of the tubes bearing along a periphery of its outer face a scale of graduations in hours of a day,

the tubes being axially aligned and rotatable with respect to each other about the tube axes,

a representation of the night sky in the northern hemisphere and another representation of the night sky in the southern hemisphere,

means within the first tube for removably supporting one of the representations cross-wise within the tube,

means within the second tube for viewing the representation, and

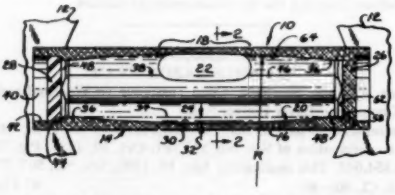
means for separably joining the tubes together so that optionally one end of the first tube is adjacent to one end of the second tube, or the other end of the first tube is adjacent to the other end of the second tube.

5,003,699

LEVEL VIAL WITH EXTENDER PITCH RANGE

Randall J. Wright, 3535 Studio Ct., Brookfield, Wis. 53005

Filed Jul. 19, 1982, Ser. No. 399,850
Int. Cl.[5] G01C 9/24
U.S. Cl. 33—379 13 Claims



1. A level vial comprising a body having a bore formed with a barrel shaped portion having opposed ends and wherein the barrel curvature is defined by a first radius of curvature, the barrel shaped portion of the bore having a cross-sectional dimension generally decreasing from the center thereof in axially opposed directions towards the ends thereof, an axially elongated core member disposed within the bore and between the opposed ends thereof in coaxial relationship with the barrel shaped portion of the body and having a maximum cross-sectional dimension and having a second radius of curvature exceeding that of the first radius of curvature of the barrel shaped bore portion, a quantity of fluid disposed within the bore and being insufficient to fill the bore and to provide a bubble therein having a dimension sufficient to simultaneously

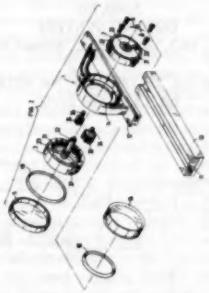
contact the surfaces of the barrel shaped bore portion and the core member, means for hermetically sealing the bore to contain the fluid and to maintain the bubble therein, the vial body having a transparent portion and indicator means associated therewith to permit visual bubble observation and for indicating preselected positions of the bubble in the vial and wherein the surfaces of the barrel shaped bore portion and the core member coact with the bubble to produce gradual bubble movement axially within the barrel shaped bore portion without abrupt bubble acceleration and while providing a wide range of visually observable angular measures.

5,003,700

INSTRUMENT FOR INDICATING AN ANGULAR POSITION OF AN OBJECT

Jeng An Liang, 153, Lane 181, Ta-Shing St., Taichung, Taiwan

Filed Apr. 19, 1990, Ser. No. 511,215
Int. Cl.[5] G01C *9/04*
U.S. Cl. 33—401 **4 Claims**



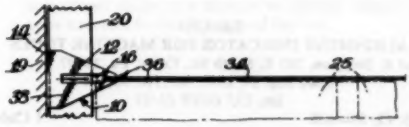
1. An instrument for indicating an angular position of an object comprising a frame body having a base portion and an annular frame fixed together; a face board which has a center hole being fixed to a front end of said annular frame, a first graduation being provided on a radially outward position of said face board; a disc having a first axle fixed to a center thereof, said first axle being rotatably supported in said center hole of said face board; a weight being provided to a lower end of said disc and being substantially symmetric about a vertical axis of said disc so that a mass center of said disc does not coincide with said first axle; and a first pointer being fixed to a front end of said first axle; and said disc being rotated by gravity when said base portion of said frame body is placed against a surface of said object so that a relative position between said first pointer and said first graduation indicates an accurate angular position of said object; a ring portion being formed on a front end of said disc, an inner gear rack being formed on an inner surface of said ring portion; a first pinion being pivoted to said face board and being engaged with said inner gear rack of said disc; a second pinion being pivoted to said face board by a second axle and being engaged with said first pinion; a second pointer being fixed to a front end of said second axle; a second graduation being provided on said face board around said second axle; and a relative position between said second pointer and said second graduation indicating an enlarged rotational angle of said first axle.

5,003,701

MASONRY CLIP

Robert J. Hughes, 3 S. Maryland Ave., Wilmington, Del. 19804, and Robert C. Williams, 2814 N. Market St., Wilmington, Del. 19802

Continuation-in-part of Ser. No. 174,152, Mar. 28, 1988, abandoned. This application Apr. 14, 1989, Ser. No. 338,588
Int. Cl.[5] G01C *15/10*
U.S. Cl. 33—409 **2 Claims**



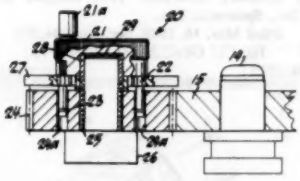
1. In combination, a masonry clip and flexible guide line for aligning successive courses of bricks when laying an internal brick wall, and a pole having predetermined reference marks thereon for successive courses of bricks arranged perpendicular to the guide line, the clip comprising a generally planar retainer leg for securing the clip in place and an integrally attached generally planar extension substantially forming a right angle with the retainer leg, the extension having a longitudinal slot therein and the slot having a longitudinal axis perpendicular to the retainer leg, the slot having a near end close to the retainer leg and a far end at the opposite end thereof, and one end of the flexible guide line extending through the slot and attached to the extension at the far end of the slot whereby the guide line may be pulled taut to form an extension of the slot so that the predetermined reference marks on the pole are viewable through the slot for alignment with the guide line.

5,003,702

MASTER GEAR TURNING ASSEMBLY

Sil Han, 321 Sunset Dr., Wilmette, Ill. 60091

Filed Apr. 20, 1989, Ser. No. 341,126
Int. Cl.[5] G01M *13/02*
U.S. Cl. 33—501.19 **27 Claims**



1. A master gear turning assembly for a gear checking system, which is of the type having a master gear rotatably engaged with a workpiece gear and means for measuring deviations of the center distance between the two gears as the master gear is turned, comprising:

a master gear arbor having an arbor shaft extending along a center turning axis and projecting in a forward direction facing toward an operator of the gear checking system;

the master gear having a central bore formed therethrough by which it is rotatably mounted on the master gear arbor shaft for engagement with the workpiece gear, wherein said master gear has at least one off-center hole formed in a forward surface thereof facing in the forward direction;

a mounting cap mounted to said master gear arbor shaft adjacent the forward surface of the master gear in alignment with the center turning axis of the master gear arbor shaft and having at least one drive pin projecting in a rearward direction opposite to the forward direction

which is received in the off-center hole in the master gear; and

turning means for turning the mounting cap which in turn drives the master gear through the at least one drive pin, wherein said mounting cap, drive pin, and turning means allow turning of said master gear through a turning force directed about said center turning axis and eliminate the necessity for turning by manual contact with said master gear.

5,003,703

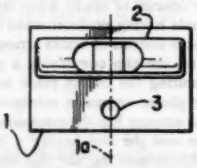
ALIGNMENT INDICATOR FOR MACHINE TOOLS

Carl E. Swanson, 707 E. South St., Corry, Pa. 16407

Filed Sep. 14, 1987, Ser. No. 95,944

Int. Cl.[5] G01B *13/19*

U.S. Cl. 33—638 **1 Claim**



1. An indicator comprising a plate having a planar lower surface adapted to rest on a cylindrical workpiece with the longitudinal axis of the plate above and in alignment with the longitudinal axis of the workpiece, a conical recess in the upper surface of the plate and on the longitudinal axis of the plate for receiving a test pin with a sharp point separated from said lower surface by a thin wall on which the point bears, and means on said plate for indicating inclination of said plate due to misalignment of said pin with the longitudinal axis of the workpiece.

5,003,704

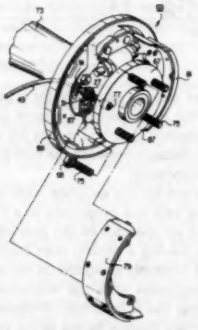
DISTANCE MEASURING DEVICE AND METHOD FOR USE WITH VEHICLES

Burton L. Schubert, Spearman, Tex., assignor to Schubert Farms, Inc., Spearman, Tex.

Filed Mar. 16, 1989, Ser. No. 324,084

Int. Cl.[5] G01C *22/00*; **G01B** *3/12*

U.S. Cl. 33—775 **8 Claims**



1. A means for measuring distance traveled by a vehicle having a wheel coupled to a vehicle axle disposed within a vehicle axle housing, with said wheel having at least one nonmagnetized vehicle wheel bolt which rotates with said wheel defining an orbit through which said at least one nonmagnetized vehicle wheel bolt passes as said wheel rotates to advance said vehicle, comprising:

a proximity sensor of the type adapted for detecting the presence of nonmagnetized metal within a sensing distance and providing an electrical response thereto, coupled to said axle housing a preselected distance from said orbit of said at least one nonmagnetized vehicle wheel bolt wherein said at least one nonmagnetized vehicle wheel bolt is within said sensing distance as it passes by said inductive proximity sensor, for indicating the passage of said at least one nonmagnetized vehicle wheel bolt past said inductive proximity sensor as said wheel is rotated to advance said vehicle; and

counter means coupled to said inductive proximity sensor for receiving said electrical response and producing a display corresponding to the distance traveled by said vehicle, wherein distance travelled by said vehicle may be measured without requiring the mounting of equipment to said wheel.

5,003,705

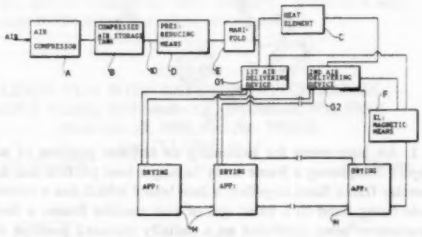
DRYING SYSTEM

Shin-Ye Lee, No. 19-2, Szu-Wei St., Shiao-Chia Chen, Tainan Hsien, Taiwan

Filed Jul. 25, 1990, Ser. No. 557,007

Int. Cl.[5] F26B *21/00*

U.S. Cl. 34—54 **7 Claims**



1. A drying system comprising:

a plurality of drying apparatuses;

an air compressor to supply air to said plurality of drying apparatuses;

a compressed air storage tank connected to said air compressor and supplied by the same;

a pressure reducing means connected to said compressed air storage tank;

a heat supplying device;

said pressure reducing means having a first air delivering device and a second air delivering device, said second air delivering device passing through said heat device so that the air coming out of said second air delivering device is heated, said first and said second air delivering devices being connected to said plurality of drying apparatuses; and

an electromagnetic control means connected to said first and said second air delivering devices and controlling the same in such a manner as to let out hot and cool air alternatively from said first and said second air delivering devices.

5,003,706

Patent Not Issued For This Number

5,003,707

PORTABLE BOOT DRYING APPARATUS

Robert J. Chu, 61-57 84th St., Queens, N.Y. 11379

Filed Mar. 19, 1990, Ser. No. 495,367
Int. Cl.[5] F26B *25/00*
U.S. Cl. 34—104 **10 Claims**

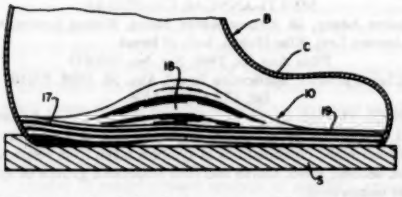
1. Apparatus for use with a portable hair dryer having a tubular discharge end, and for supplying a flow of warm air to a pair of ski boots, comprising an adaptor fitting having a body with a tubular inlet opening and a pair of outlet openings and a communicating passage therebetween, said inlet opening being adapted to internally receive insertion of the discharge end of the hair dryer, and separate lengths of flexible tubing connected to said adaptor at the respective outlet openings, each of said tubing lengths being selected to extend both downwardly into a boot as well as to bend forward with extension at least substantially to the toe end of the interior of a boot, said inlet opening comprising a single counterbore of diameter exceeding that of a dryer discharge end to be used therewith, and an annular insert of flexible yieldable material retained in said counterbore, said insert having a bore which is characterized by a taper which reduces in the direction of dryer flow into said body, said taper ranging from a diameter exceeding that of the dryer discharge end and reducing to a diameter less than that of the dryer discharge end.

5,003,708

CUSTOM INSOLE FOR ATHLETIC SHOES

Peter A. Daley, Steamboat Springs, Colo., assignor to Dynamic Foam Products, Inc., Steamboat Springs, Colo.

Division of Ser. No. 248,612, Sep. 26, 1988, Pat. No. 4,901,390.
This application Dec. 1, 1989, Ser. No. 444,713
Int. Cl.[5] A43B *13/40*
U.S. Cl. 36—44 **11 Claims**



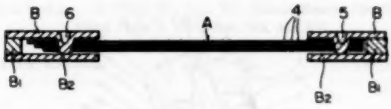
1. A custom insole for footwear comprising:
a plurality of layers of thermoformable materials united together at their interfaces, all of said layers being coextensive with one another and conforming in size and contour to the bottom surface of a foot, said layers comprising at least one upper strength layer having a density of about 11 lbs. per cubic foot with a thickness of about $\frac{1}{8}$", and at least one lower filler layer united to said strength layer having a density of about lbs. per cubic foot to 6 lbs. per cubic foot and a thickness of about 1/16", said layers when united together being of substantially uniform thickness and including an upwardly extending arch flange curving upwardly along an arch area between a heel and frontal area of said insole for a distance to laterally support the bone structure in the arch area of the foot.

5,003,709

PRICK-PREVENTING SHOE

Kenji Okayasu, Gyoda, and Hideo Okayasu, Tokyo, both of Japan, assignors to Rikio Co., Ltd., Gyoda, Japan

Continuation of Ser. No. 176,231, Mar. 31, 1988, abandoned.
This application Jan. 10, 1990, Ser. No. 462,989
Int. Cl.[5] A43B *13/42, 13/10*
U.S. Cl. 36—107 **2 Claims**

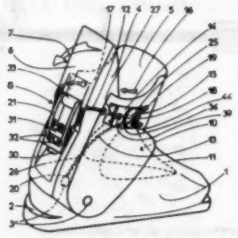


1. A prick-preventing shoe comprising:
a grounding sole;
an inner sole;
a prick-preventing metallic core sandwiched between said grounding sole and said inner sole and shaped to match the shape of at least a portion of said grounding sole, said metallic core being composed of a plurality of amorphous metal foils slidable with respect to each other and stacked in engagement with each other; and
a laminate including three metal members adhered to one another and an intermediate member of said three metal members being shortened to sandwich said metallic core between a remaining upper member and a remaining lower member of said three metal members.

5,003,710
SKI BOOT
Alessandro Pozzobon, Paderno Di Ponzano Veneto, Italy, assignor to Nordica S.p.A., Montebelluna, Italy
Filed May 7, 1990, Ser. No. 519,584
Claims priority, application Italy, May 22, 1989, 82544 A/89
Int. Cl.[5] A43B 5/04
U.S. Cl. 36—117 11 Claims

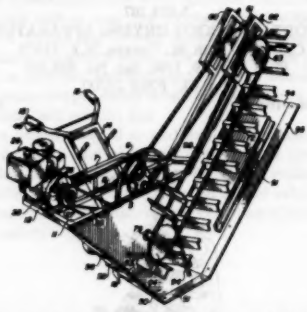
1. Ski boot comprising a shell, a front quarter and a rear quarter, said rear quarter and said front quarter being articulated to said shell, wherein said front quarter comprises at least a first element and a second element, said first element at least partially overlapping said second element, each of said first element and second element having a lower portion connected to said shell and an upper portion, at least one of said first and second elements having at least one flap at said upper portions, fastening means being provided at said upper portions for fastening said front quarter onto said rear quarter.

5,003,711
ALPINE SKI BOOT
Bernard Nerrinck, La Balme-de-Sillingy, and Maurice Bonnet, Rumilly, both of France, assignors to Salomon S.A., Annecy Cedex, France
Filed Jun. 25, 1985, Ser. No. 748,458
Claims priority, application France, Jul. 13, 1984, 84 12099
Int. Cl.[5] A43B 5/04
U.S. Cl. 36—120 180 Claims



1. A ski boot for holding the foot and the lower leg of a skier, wherein said ski boot comprises:
(a) an upper surrounding said lower leg of the skier;
(b) a base for surrounding the foot of the skier;
(c) means for closing said upper on said lower leg of the skier comprising a first traction element;
(d) means for holding said foot in said boot comprising a second traction element; and
(e) means for linking said closing and holding means, wherein said linking means comprises at least one countershaft for changing the direction in which one of said first traction element and said second traction element extends.

5,003,712
APPARATUS FOR CLEANING IRRIGATION DITCH
Rex P. Mitchell, 1263 E. Avila, Casa Grande, Ariz. 85222
Filed Aug. 28, 1989, Ser. No. 400,400
Int. Cl.[5] E02F 5/02, 3/02
U.S. Cl. 37—80 R 15 Claims



1. Apparatus for removing debris from an irrigation ditch bounded by a bottom surface with side members extending upwardly therefrom said apparatus comprising:
(a) a frame including a drive wheel for movably contacting the bottom surface of an irrigation ditch;
(b) drive means mounted on said frame and coupled to said drive wheel for propelling said frame along the ditch;
(c) control means affixed to said frame for permitting operator control of said drive means;
(d) a forwardly-extending base member affixed to said frame, said base member having first and second opposing side edges and forward and rear edges;
(e) first and second upwardly-extending side members affixed to said first and second side edges respectively, said base and side members being dimensioned to fit within said ditch;
(f) a frame extension extending laterally from said frame in the direction of said second side member;
(g) transport means for moving the debris, said transport means being mounted on said frame and frame extension spaced adjacent to said second side member and including:
i. first and second sprockets affixed to said frame and said frame extension respectively, said first sprocket being located on said frame proximate to the base member, and
ii. a chain containing spaced flights and encircling said first and second sprockets; and
(h) coupling means connected to said drive means and including clutch means for controlling movement of said chain for imparting movement to the transport means whereby debris located on said base member is urged by the flights of said transport means upwardly along said second side member for removal from the ditch.

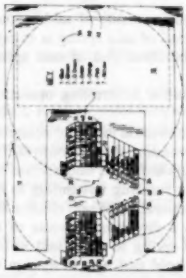
5,003,713
MULTI-ANNUAL CALENDAR
Shalom Adany, 26 Aharon Karon Street, Rishon Lezion, and Amram Levi, Kfar Habad, both of Israel
Filed Aug. 28, 1989, Ser. No. 399,619
Claims priority, application Israel, Aug. 30, 1988, 87610
Int. Cl.[5] G09D 3/08
U.S. Cl. 40—113 3 Claims

1. Apparatus for selectably displaying one of a plurality of predetermined combinations of symbols taken from respective first, second, third, fourth and fifth respective groups of symbols comprising:
display means; and
a planar cover for said display means, said planar cover

having an arrangement of first display windows, a single second display window, a single third display window, and an arrangement of fourth display windows; said planar cover also defining first, second and third rotation axes respectively associated with said arrangements of first and fourth display windows, said second display window and said third display window, said display means comprising:

a first planar display member on which is provided said first group of symbols and which is mounted for rotation about said first axis in a plane parallel to said cover so as to permit alignment of predetermined symbols of said first group of symbols in registration with respective ones of each of said arrangements of first and second display windows so as to be displayed thereat;

a second planar display member on which is provided said second group of symbols and which is mounted for rotation about said second axis in a plane parallel to said cover so as to permit alignment of one of a plurality of predetermined portions of said second group of symbols, corresponding to a predetermined symbol of said first group of symbols displayed at said one of said arrangement of first windows, in registration with said second window so as to be displayed thereat, said second planar display member further having a fifth display window adjacent to each said predetermined portion of said second group of symbols;



a third planar display member on which is provided said third group of symbols, said third planar display member also being mounted for rotation about said second axis in a plane parallel to said cover so as to permit alignment of a number of predetermined symbols of said third group of symbols, supplementary to said displayed portion of said second group of symbols, in registration with a predetermined fifth display window so as to be displayed thereat;

a fourth planar display member on which is provided said fourth group of symbols and which is mounted for rotation about said third axis in a plane parallel to said cover so as to permit alignment of one of a plurality of predetermined portions of said fourth group of symbols, corresponding to a predetermined symbol of said first group of symbols displayed at said arrangement of fourth windows, in registration with said third window so as to be displayed thereat, said fourth planar display member further having a sixth display window adjacent to each said predetermined portion of said fourth group of symbols; and

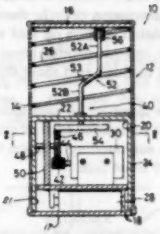
a fifth planar display member on which is provided said fifth group of symbols, said fifth planar display member also being mounted for rotation about said third axis in a plane parallel to said planar cover so as to permit alignment of a number of predetermined symbols of said fifth group of symbols, supplementary to said displayed plurality of said fourth group of symbols, in registration with a predetermined sixth display window so as to be displayed thereat.

5,003,714

FIGURE MOVING ARTICLE

Yasuta Satoh, and Yasuyuki Moriyama, both of Nagareyama, Japan, assignors to Takara Co., Ltd., Tokyo, Japan

Filed May 10, 1990, Ser. No. 521,738
Claims priority, application Japan, May 11, 1989, 1-54190[U]
Int. Cl.[5] G09F *19/08*
U.S. Cl. 40—414 **22 Claims**



1. A novelty can capable of simulating the appearance of a container, comprising:

rigid upper and lower circular lid members of substantially the same size;

a cylindrical flexible casing, shaped to simulate the casing of a can, being attached to, respectively, the upper and lower lid members and extending between them to enclose a space between the upper and lower lid members;

a motor assembly contained between the upper and lower rigid lid embers, operatively connected to relatively move the upper and lower lid members both towards and away from each other in vertical and horizontal directions, the flexible casing member being deformed from and returned to a cylindrical shape during a cycle of relative movement of the upper and lower lid members, and

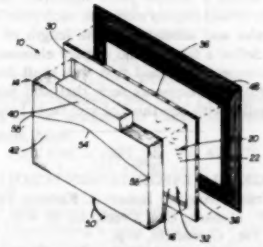
means for sensing sound contained between the upper lid member and a lower surface of the lower lid member and connected to the motor assembly, whereby the motor assembly can be activated by sound to cause movement of the novelty can.

5,003,715

PAINTED DISPLAY ASSEMBLY

Norm Steiner, 230 174th St., Apt. 717, Miami Beach, Fla. 33160

Filed May 7, 1990, Ser. No. 519,631
Int. Cl.[5] G09F *13/00*
U.S. Cl. 40—442 **13 Claims**



1. A painted display assembly comprising:

a. a mounting rack having a frame structure and including a plurality of slats interconnected with one another at opposite ends in surrounding relation to an open center,

b. a sheet of light transmitting material including an exposed front face and an oppositely disposed rear face, said sheet mounted to said mounting rack around a peripheral edge of said sheet in covering relation to said open center,

c. a light assembly including a light source mounted to a light directing means for directing light through said sheet, said light directing means mounted to an opposite side of said mounting rack, congruent to said sheet in surrounding, covering relation to said open center,

d. a main painted portion on said exposed front face including opaque areas of concentrated paint sufficiently blocking the passage of light therethrough and translucent areas of diluted paint, said translucent areas adapted to permit at least partial transmission of light therethrough,

e. a secondary painted portion on said rear face comprising secondary dark, opaque painted areas in blocking relation to light passing through said sheet defining a background image, and

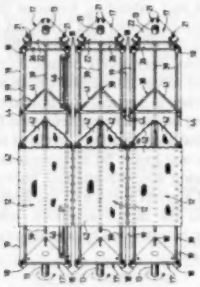
f. a picture frame mounted to said mounting rack substantially covering a peripheral edge of said exposed front face of said sheet in surrounding relation to a viewing surface on said exposed front face.

5,003,716

FLEXIBLE OUTDOOR FLIP SIGN DISPLAY

Royce M. Dyar, P.O. Box 82, Locust Fork, Ala. 35097

Filed Feb. 27, 1989, Ser. No. 315,797
Int. Cl.[5] G09F *11/02*
U.S. Cl. 40—503 **13 Claims**



9. An advertising display comprising a rigid frame supporting a plurality of rotatably mounted elongated display elements, each display element having a first and second axial stub shaft at each end, said stub shafts engaged by said frame and having a lightweight boom disposed between said stub shafts to hold said shafts in spaced relation; means affixed to said boom for supporting a set of inelastic cables in parallel spaced relation to said boom; a flexible panel supported on said cables longitudinally of said display elements, each panel being generally rectangular and substantially the length of said display elements to define a face of said display element; and means operatively connected to said first stub shaft for selectively rotating said display elements such that said faces are positioned in parallel with one third of said faces being co-planar.

5,003,717

CHANGEABLE INFORMATION SCROLL SIGN

Charles E. Trame, Mequon; Robert A. Karsten, Fox Point, and Michael W. Hobach, Oak Creek, all of Wis., assignors to Everbrite, Inc., Greenfield, Wis.

Filed Sep. 18, 1989, Ser. No. 408,993
Int. Cl.[5] G09F *11/18*
U.S. Cl. 40—518 **8 Claims**

1. A scrolling sign comprising:

spaced apart support members,

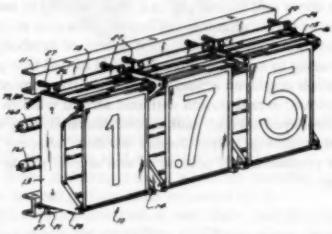
first and second rollers arranged between said support members in spaced apart relationship for rotating about parallel axes and a web on said rollers having opposite end portions fastened to the rollers respectively, and containing a series of indicia to be presented for viewing between rollers,

means on which said rollers are journaled for rotation relative to said support members,

a reversible electric motor including a motor body and a shaft mounted inside of the first of said rollers,

means for connecting said body to said first roller and means for securing said shaft against rotation such that when the motor is energized said first roller is driven rotationally, rotation of said first roller in one direction allowing said web to unwind from said first roller and rotation in the opposite direction allowing said web to wind on said first one roller,

a constant force spirally wound spring disposed inside of the second roller, said spring having opposite ends,



a stationary member inside of said second roller to which member one end of said spring is engaged and means for connecting the other end of said spring to said second roller,

controller means for controlling operation of said electric motor,

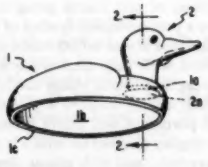
operation of said electric motor to rotate said first roller in a direction for winding the web onto said first roller causing the web to unwind from said second roller and to wind said spring for resisting unwinding to maintain tension in said web and operation of said electric motor to rotate said first roller in a direction opposite of said one direction allowing said spring to wind said web onto said second roller and to hold said web in tension when operation of said motor terminates.

5,003,718

GAME BIRD DECOYS

Steven A. Lenert, 3506 Woodleaf Dr., Shreveport, La. 71118, and Robert D. Berkley, 29 Echo Ridge, Haughton, La. 71037

Continuation-in-part of Ser. No. 7/115,812, Nov. 2, 1987, abandoned. This application May 8, 1989, Ser. No. 349,946
Int. Cl.[5] A01M *31/06*
U.S. Cl. 43—3 **14 Claims**



1. A game bird decoy comprising:

a buoyant open concave shell comprising soft, flexible foam sheet material, said soft, flexible sheet material being foldable and deformable and able to regain its original shape upon release of restraints after being deformed, said shell representing an upper body portion of a game bird includ-

ing an inner concave surface having a continuous circumferential lower edge extending around the shell at the position of the waterline when the game bird being simulated is sitting in the water, wherein the concave decoy body is open to the water within said circumferential lower edge, and

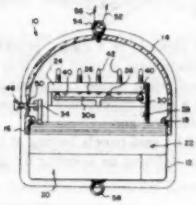
an outer substantially convex surface of the open concave shell, said convex surface molded to simulate the upper body portion of a game bird.

5,003,719

ELECTROMOTIVE FISH ATTRACTOR

Arthur D. Whitlock, Rte. 3, Box 72 A, Henryetta, Okla. 74437, and George Spector, 233 Broadway, RM 3815, New York, N.Y. 10007

Filed Dec. 8, 1989, Ser. No. 447,786
Int. Cl.[5] A01K *93/00*
U.S. Cl. 43—17.5 **3 Claims**



1. An apparatus for attracting fish which comprises:

(a) a housing;

(b) a transparent dome removably attached to and sealed with said housing so as to make interior waterproof;

(c) means carried within said housing for producing a buzzing sound to attract the fish;

(d) means carried within said housing which extends into said dome for producing a series of blinking lights to attract the fish; wherein said buzzing sound means includes:

(e) a stator having a set of contacts attached in series thereon;

(f) an electric motor having a stator arm which will make contact with each of said contacts when the stator arm rotates;

(g) a battery for supplying electricity to said electric motor;

(h) a switch electrically connected between said battery and said electric motor for operating said electric motor;

(i) a buzzer electrically connected between said battery and said contacts for making the buzzing sound when the stator arm touches each of said contacts; and

(j) a variable resistor electrically connected between said buzzer and said contacts to change the volume of the buzzing sound.

5,003,720

FISH LURE

Robert E. Henry, 1729 Greer Dr., W., Newark, Ohio 43055

Filed Dec. 22, 1989, Ser. No. 455,142
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.39 **4 Claims**

1. An improved fishing lure apparatus for simulating aquatic movement while being retrieved said apparatus comprising:

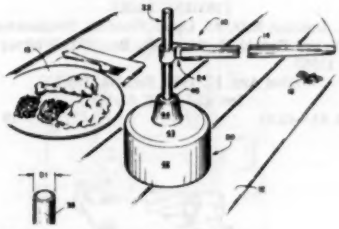
connecting means having front and rear end, said front end of said means having line attaching means, said rear end having pivoting means, fish lure attached to said pivoting connecting means, weight means mounted upon said connecting means, front and rear stop means located at said front and rear of said connecting means so that said stop means limit the movement of said weight means along said connecting means during retrieval of said apparatus.

5,003,721

FLY DETERRENT APPARATUS

James T. Underwood, 960 Albion St., San Diego, Calif. 92106

Filed Jan. 5, 1990, Ser. No. 461,331
Int. Cl.[5] A01M *1/00*
U.S. Cl. 43—132.1 **7 Claims**



1. A fly deterrent apparatus comprising:

a housing having a top wall;

a vertically oriented shaft having a top end, a bottom end and a predetermined diameter D1, said shaft having a vertical axis;

means for rotatably mounting the bottom end of said shaft in the top wall of said housing;

an elongated wand having a predetermined length, said wand having a front end, a rear end and a longitudinally extending axis, said wand being made of flexible material such that when it is rotated in a horizontal plane its longitudinal axis assumes a curved arc configuration; and

means for detachably connecting the rear end of said wand to said shaft comprising a wand holder having an elongated body portion having a front end, a rear end, and a front face, a vertically oriented tubular member is formed on said rear end and it has a diameter to frictionally engage said shaft, the front face of said wand holder has a horizontally extending concave front face portion that is vertically surrounded by an upper groove, an upper flange, a lower groove and a lower flange.

5,003,722

FLYING GAME BIRD DECOYS

Robert D. Berkley, Haughton, and Terry P. Shaughnessy, Hackberry, both of La., assignors to Packaging Industries Group, Inc., Hyannis, Mass.

Filed Oct. 3, 1989, Ser. No. 416,479
Int. Cl.[5] A01M *31/06*
U.S. Cl. 43—3 **17 Claims**

1. A game bird decoy comprising:

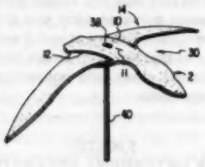
means for representing a body portion of a game bird comprising flexible foamed sheet plastic material;

means for representing a wing portion of a game bird comprising flexible foamed sheet plastic material; and

means for securing said wing portion means to said body portion means;

wherein said wing portion means is inserted through slits in said body portion means and said securing means comprises a clip for securing the wing portion means and the body portion means together by passing said clip through

slits in said body portion means and said wing portion means respectively,

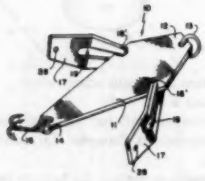


whereby said game bird decoy simulates a game bird in flight when viewed from above.

5,003,723
FISHING LURE

Davy L. Dutcher, R.D. #5, Upper Front St., Binghamton, N.Y. 13901, and Ronald H. Secoolish, Box 191, Whitney Point, N.Y. 13862

Filed Aug. 17, 1989, Ser. No. 394,920
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.13 **19 Claims**



1. A fishing lure for simulating the swimming motions and actions of a fish or insect when caused to move back and forth under the tidal action of the sea, comprising:

a substantially flat planar body section having two flat parallel surfaces and substantially perpendicular side surfaces simulative of a body of a fish or insect as viewed in profile having means defining apertures perpendicular to said two flat parallel surfaces disposed therein at distal ends thereof, and first and second attachment portions comprising first and second ring fasteners disposed in said apertures;

said first ring fastener for securing a line to said first attachment portion of said body section, and a hook to said second ring fastener disposed in the aperture of said second attachment portion of said body section; and

at least one articulated wing-like member hinged perpendicular to said flat parallel body surfaces for providing a simulation of motion of a part of said body of said fish or insect, said articulated member having a slot therein for receiving a portion of said flat body section, and lying substantially flush to an outer surface thereto when said articulated member is in a retracted position and movable back and forth over said outer surface of said body section under the influence of the tidal action of the sea, said fishing lure giving the appearance of a swimming fish or insect under said tidal action of the sea by reason of the back and forth movement of said articulated member.

5,003,724
TREE GRATE SYSTEM

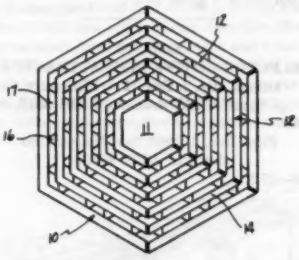
Emile Vestuti, Apartado 80,896, Caracas, 1080-A, Venezuela

Filed Jun. 15, 1989, Ser. No. 366,682
Int. Cl.[5] A01G *17/00*
U.S. Cl. 47—25 **17 Claims**

1. A tree grate system for covering an opening while enabling water and other materials to be provided to a tree, said system comprising:

a substantially planar grill formed by at least two grate panels;

each said panel having an innermost grate element and at least one additional grate element outside of said innermost grate element and means for facilitating removal of a



desired grate element in a clean, presentable manner in order to accommodate growth of a tree trunk;

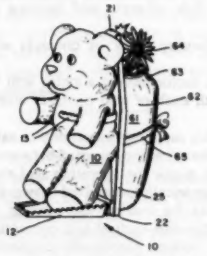
said removal facilitating means comprising frangible means for providing a clean appearance adjacent each said additional grate element; and

said grill formed by said panels having at least two rings of grate elements defining an opening for said tree trunk.

5,003,725
HOLDER FOR A STUFFED TOY ANIMAL FOR USE WITH A FLORAL ARRANGEMENT

Ricky R. Maddox, 6271 Bannock Rd., Westminister, Calif. 92683

Filed Dec. 20, 1989, Ser. No. 453,604
Int. Cl.[5] A47G *7/02*
U.S. Cl. 47—39 **1 Claim**



1. A holder for a stuffed toy animal for use with a floral arrangement which includes a vase with an outer surface and a peripheral lip and flowers which are disposed in the vase, said holder comprising:

a. a back frame having a top member, a bottom member and two side members which have a pair of ribbon slits disposed thereon whereby a ribbon is threaded through said ribbon slits and around the outer surface of the vase in order to tie said holder to the vase for both delivery and display;

b. a base platform which is mechanically coupled to said bottom member of said back frame and on which the stuffed toy animal is placed in an upright position relative to said base platform;

c. holding means for holding the stuffed toy animal in its upright position, said holding means being mechanically coupled to said two side members of said back frame; and

d. vase hooking means for hooking the peripheral lip of the vase, said vase hooking means being mechanically cou-

pled to said top member of said back frame and having a screw hole so that once the ribbon has been untied said holder may be mounted on a wall by using a screw through said screw hole so that said vase hooking means secures said holder to the wall in order to display the stuffed toy animal.

5,003,726

METHOD FOR PROTECTING DRIP IRRIGATION HOSES AND OTHER STRUCTURES FROM ROOT INTRUSION

Davies Allport, La Jolla, Calif., assignor to T-Systems Corp., San Diego, Calif.

Continuation of Ser. No. 313,588, Feb. 21, 1989, abandoned. This application Apr. 17, 1990, Ser. No. 511,971
Int. Cl.[5] C05G 3/04
U.S. Cl. 47—48.5 6 Claims

1. A method of prohibiting the growth of roots into the outlets of a drip irrigation hose having distributed outlets in proximity to planted soil, the method comprising the steps of:

supplying water under pressure to the hose for drip irrigation of the soil;

introducing into the hose upstream of the outlets a soil retainable, water transportable substance to form in the vicinity of the outlets localized regions containing the substance, the soil retainable substance also being capable of absorbing a selected root inhibiting water transportable substance; and

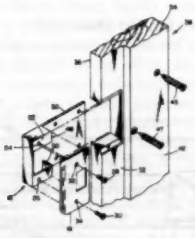
introducing into the hose upstream of the outlets the selected root inhibiting substance to distribute such root inhibiting substance to the localized regions for absorption by the soil retainable substance.

5,003,727

APPARATUS FOR IMPROVING DOOR SECURITY

Edwin E. Watten, 1908 S. 40th Ave., Yakima, Wash. 98903

Continuation-in-part of Ser. No. 339,518, Apr. 17, 1989, abandoned. This application Jun. 20, 1990, Ser. No. 540,855
Int. Cl.[5] E06B 1/04; E05C 21/02
U.S. Cl. 49—504 4 Claims



1. In combination

a. framing for a door;

b. a door jamb mounted to said framing, said door jamb having an exterior side adjacent said framing and an interior side opposite said exterior side;

c. a door mounted to said door jamb, said door having locking means, said locking means having an extended portion rigidly extending outwardly from said door when said locking means is in a locked position;

d. strike plate support means fastened to said door jamb, said strike plate support means having a strike box integral with said strike plate support means, said strike box adapted to accept said locking means; and

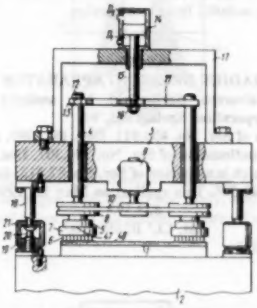
e. a strike plate fastened to said strike box, said strike plate adapted to receive the extended portion of locking means when said door is in a closed position and said locking means is in a locked position.

5,003,728

MACHINE FOR ABRASIVE TREATMENT

Teimuraz N. Loladze; Boris I. Batiashvili; Gennady L. Mamulashvili; David S. Batskhrikidze; Georgy J. Grdzelishvili, and Jury I. Markevich, all of Tbilisi, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky I Proektno-Konstruktorsky Institut Atomnogo Energeticheskogo Machinostroenia USSR, Moscow, U.S.S.R.

PCT No. PCT/SU87/00084, § 371 Date Nov. 7, 1988, § 102(e) Date Nov. 7, 1988, PCT Pub. No. WO88/06949, PCT Pub. Date Sep. 22, 1988
PCT Filed Jul. 31, 1987, Ser. No. 283,369
Claims priority, application U.S.S.R., Mar. 10, 1987, 4201397
Int. Cl.[5] B24B 49/00
U.S. Cl. 51—165.8 3 Claims



1. A machine for abrasive treatment, said machine comprising

an abrasive tool,

a device for establishing a holding-down force between workpieces and the abrasive tool within a machining zone, said device having a housing with guideways, wherein poppet sleeves each carrying a spindle mounting one of said workpieces are free to reciprocate so as to translate the holding-down force to the abrasive tool, and

a feed mechanism located on the housing,

said poppet sleeves being rigidly interconnected through an elastic member,

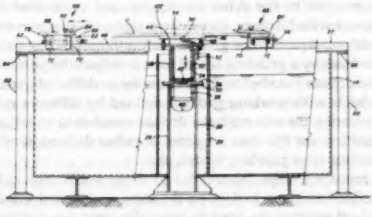
said elastic member also being rigidly coupled to said feed mechanism, while said feed mechanism is adapted to damp travel of said elastic member in forward and reverse directions of feed.

5,003,729

SUPPORT SYSTEM FOR ABRASIVE JET CUTTING

James E. Sherby, Wilkinsburg Township, Allegheny County, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 11, 1988, Ser. No. 255,219
Int. Cl.[5] B24C 1/00
U.S. Cl. 51—283 R 19 Claims



1. An apparatus for cutting a sheet whereby vibrations of

selected components of the apparatus are substantially isolated from one another, the apparatus comprising:

a base;

a catcher tank;

sheet support means;

edge engaging means;

means for mounting said edge engaging means above said catcher tank;

means for securing said edge engaging means directly to said base, said sheet support means above said tank and directly to said base, and said catcher tank directly to said base; and

wherein said edge engaging means, said sheet support and said catcher tank are mounted independent from one another whereby vibrations of said edge engaging means, said sheet support column and said catcher tank are substantially isolated from one another.

5,003,730

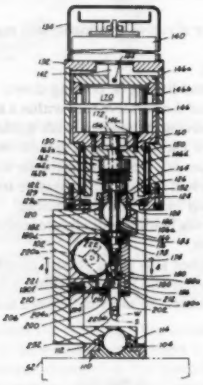
RADIUS DRESSING APPARATUS

James V. Halvorsen, Springfield, Vt., assignor to Bryant Grinder Corporation, Springfield, Vt.

Continuation of Ser. No. 455,911, Dec. 18, 1989, abandoned, which is a continuation of Ser. No. 284,307, Dec. 14, 1988, abandoned, which is a division of Ser. No. 87,813, Aug. 19, 1987, Pat. No. 4,805,585. This application May 14, 1990, Ser. No. 523,193

Int. Cl.[5] B24B *1/00*

U.S. Cl. 51—325 **5 Claims**



1. A method for dressing a radius-defined working surface of a grinding wheel, comprising the steps of:

(a) adjustably mounting a dresser member on a pivotal arm having a pivot axis,

(b) adjusting the position of the dresser member on the arm relative to the pivot axis thereof using a drive mechanism disposed on the pivotal arm and a drive motor operatively connected to the drive mechanism and controlled by a stored wheel dresser computer program that is correlated with workparts to be ground with different radius-defined surfaces by a grinding wheel so as to adjust the position of the dresser member to dress the same or different grinding wheels with working surfaces defined by different radii,

(c) pivoting the arm with the dresser member in an adjusted position on the arm to dress a radius-defined working surface on a grinding wheel, and

(d) repeating steps (b) and (c) to dress a different radius-defined working surface on the same or different grinding wheel without the need to manually reset the position of the dresser member on the pivotal arm.

5,003,731

BELT CONVEYOR SYSTEM FOR A CONVEYOR BELT FASHIONED AS A BRAIDED WEB

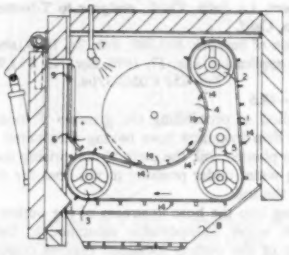
Dieter Dürr, München, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Nov. 21, 1989, Ser. No. 439,986

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1988, 3839380

Int. Cl.[5] B24C *3/08*

U.S. Cl. 51—418 **9 Claims**



1. A belt conveyor system utilizing a conveyor belt fashioned as a braided web comprising a rotating conveyor means (**10, 11, 12**) including spaced parallel chains (**10, 11**) joined to one another by a plurality of crossbars (**12**); the braided web being comprised of a wire mesh connected to the conveyor means (**10, 11, 12**) in a shape-mating fashion by means of a plurality of dogs (**13**) each configured as a comb and welded in spaced relation with respect to one another to the crossbars (**12**), the dogs each projecting into and each being welded to the braided web (**1**).

5,003,732

ROOF VERGE SYSTEM

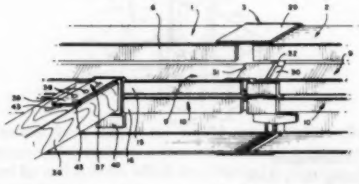
Geoffrey C. Quinnell, Pembury, England, assignor to Marley Tile A.G., Switzerland

Filed Feb. 9, 1989, Ser. No. 307,965

Claims priority, application United Kingdom, Feb. 9, 1988, 8802875

Int. Cl.[5] E04B *7/00*

U.S. Cl. 52—94 **22 Claims**



1. An elongate roof verge member for covering edges of roof covering members at a verge of a pitched roof, comprising an upwardly directed outer portion having longitudinal side edges for concealing the edges of the roof covering members, inwardly directed flanges adjacent said longitudinal side edges of the outer portion, and a first water conducting member on an inner surface of the outer portion, the first water conducting member facing one of the flanges and defining therewith a first gap adapted to receive the edge of a roof covering member having a first thickness, said roof verge member also comprising a second water conducting member facing the other of the flanges and defining therewith an alternative gap adapted to receive the edge of a roof covering member having a second thickness different from the first thickness when the roof verge member is inverted, the alterna-

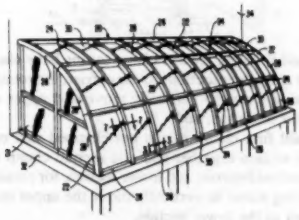
tive gap being of a different size than the first gap, said first and second water conducting members being adapted to conduct water longitudinally along said outer portion.

5,003,733

STRUCTURE AND COMPONENTS FOR ENCLOSING SUN SPACES AND THE LIKE AND METHOD FOR ERECTING SAME

Frederick P. Strobl, Jr., 204 N. Shore Dr., Cary, Ill. 60013, and Jack E. Gistt, 134 S. Hills Dr., Barrington, Ill. 60010

Filed Jul. 26, 1989, Ser. No. 385,871
Int. Cl.[5] E04B *1/32*
U.S. Cl. 52—86 14 Claims



1. A beam member for supporting sheets of construction material comprising:

an elongated, generally planar, central web element, said web element having longitudinally spaced opposite ends and laterally spaced, longitudinally extending opposite edge portions;

an outer flange member rigidly connected to the web element at each of its said edge portions, each of said outer flange members extending longitudinally of the web element along the corresponding edge portion and transversely outwardly away from the web element;

at least an inner flange for each of the outer flange members, each inner flange being rigidly connected to the web element at a location between the outer flange members and extending longitudinally thereof from one of the ends of the web element to the other, each inner flange also extending transversely outwardly away from the web element to present an outer edge and being disposed in laterally spaced, generally parallel relationship relative to a corresponding outer flange member to present an elongated rabbet therebetween that is open at each end and which extends longitudinally of the web element for receiving the edge of a sheet of construction material; and

an end flange extending laterally across the web element between the inner flanges at least one end of the web element in a position which does not cover the open ends of the rabbets, said end flange being rigidly connected to the web element and extending transversely outwardly away from the web element.

5,003,734

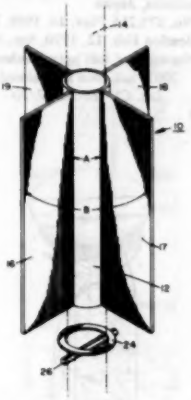
ANIMAL GUARD FOR POSTS

Howard Dinsmore, 11 Newbridge Rd., Brookfield, Conn. 06804

Filed Oct. 23, 1989, Ser. No. 424,918
Int. Cl.[5] E04B *1/72*
U.S. Cl. 52—101 4 Claims

1. A guard to prevent an animal from climbing a post, comprising:

(a) a central, elongated, hollow, body disposed vertically over said post; and



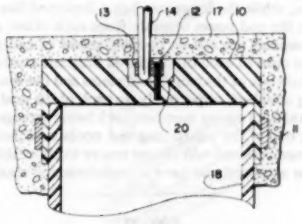
(b) a plurality of longitudinal, vertical fins, having distal and proximal edges, attached to said body, said fins extending outwardly from the peripheral surface of said body.

5,003,735

MARKER SCREW CAP

James H. Bates, 8809 Youngdale, San Gabriel, Calif. 91775

Filed Dec. 5, 1989, Ser. No. 446,075
Int. Cl.[5] E04B *1/00*; F16L *55/00*
U.S. Cl. 52—105 4 Claims



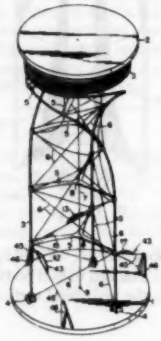
1. A device locating a marker screw which has one end threadably engaged within a recess in a cover of an outlet in a duct and which is adapted to extend outwardly from the cover toward an outer surface of a wall or floor, during and after pouring of the wall or floor to embed the duct means, the other end of said marker screw adapted to be roughly adjusted below the outer surface, said device comprising a tubular holder attached to said marker screw, elongated resilient fibers positioned and connected at one end in said tubular holder with their other end projecting outwardly beyond the outer surface of the poured wall or floor, for resiliently yielding and temporarily bending over upon engagement by means employed in finishing said outer surface, thus facilitating location of said marker screw after the wall or floor has been poured.

5,003,736

DEPLOYABLE AND COLLAPSIBLE STRUCTURE

Kakuma Okazaki, Yokohama, and Takayuki Kitamura, Yososuka, both of Japan, assignors to Japan Aircraft Mfg. Co., Ltd., Yokohama, Japan

Division of Ser. No. 272,215, Nov. 14, 1988, Pat. No. 4,918,884.
This application Feb. 12, 1990, Ser. No. 478,662
The portion of the term of this patent subsequent to Apr. 24, 2007, has been disclaimed.
Int. Cl.[5] E04H *12/20*
U.S. Cl. 52—108 1 Claim



1. A deployable and collapsible structure comprising a pair of end plates; plural longerons arranged parallel to one another and elastically buckled, said longerons being pivoted on the end plates at their both ends; a plurality of radial spacers arranged along the axial direction of the longerons equally spaced from their adjacent ones; paired diagonal cords stretched between two adjacent radial spacers, between the lowest radial spacer and its closest end plate, and between the uppermost radial spacer and its closest end plate; and a pull cord connected to at least one of the end plates, one of the pair of end plates being moved toward the other when the pull cord is pulled, while one of the pair of end plates being separated from the other when the pull cord is loosened, and the longerons being buckled like a coil when the end plates approach each other, while the longerons being deployed like a straight line when the end plates separate from each other; a plurality of post members erected on one of the pair of end plates, one end of one cord of each of the paired diagonal cords stretched between said one of the pair of end plates and the spacer closest to it being attached, respectively, to each of the post members; and a plurality of spring members each being arranged, respectively, on one of the paired diagonal cords stretched between the post members and said closest spacer to allow this diagonal cord to be extended and have a predetermined tension.

5,003,737

SIDE RAIL FOR TRENCHDUCT

John P. Penczak, Parkersburg, W. Va., assignor to Butler Manufacturing Company, Kansas City, Mo.

Filed Oct. 13, 1989, Ser. No. 420,950
Int. Cl.[5] E04B *5/48*
U.S. Cl. 52—126.2 14 Claims

1. A side rail for a trench duct to be supported in a horizontal position over a subfloor

a lower section;

an upper section;

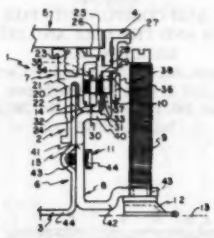
a carrier;

first clamp means, operable for clamping said carrier and said upper section together and further operable for releasing the same;

second clamp means operable for clamping said carrier and said lower section together and further operable for releasing same;

an adjusting screw connected with said carrier to interengage said subfloor when said trenchduct is in said horizontal position.

said lower section, said upper section, said carrier and said first and second clamps means functioning as follows:



when said first and second clamp means have clamped said upper and lower sections to the carrier, for rotation of said adjusting screw to vertically move said upper and lower sections in unison; and

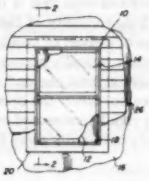
when said first clamp means has clamped said carrier and upper section together and said second clamp means has released said carrier and lower section, for rotation of said adjusting screw to vertically move the upper section with respect to the lower section.

5,003,738

ARTICLE AND METHOD OF IMPROVING EXTERIOR BUILDING APPEARANCE

Robert Hogeland, R.D. #2, Zimmerman Rd., Newmanstown, Pa. 17073

Filed Jun. 18, 1990, Ser. No. 539,492
Int. Cl.[5] E06B *3/26;* B44F *7/00*
U.S. Cl. 52—202 16 Claims



16. An exterior wall of a building, comprising:

a wall having an exterior and interior surface;

a frame for supporting one or more glazing panels, said frame being attached to said wall such that it is visible on the exterior surface of said wall;

at least one glazing panel being installed in said frame, said panel being provided with structure on its periphery which simulates a window sash; and

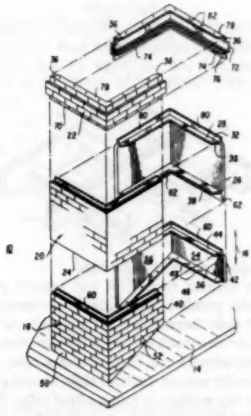
said frame being provided with structure which simulates the outer appearance of a window frame.

5,003,739

CHIMNEY FACADE SYSTEM

R. Wayne Newsome, P.O. Box 39, Columbia, Md. 21045

Continuation of Ser. No. 81,804, Aug. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 868,090, May 29, 1986, Pat. No. 4,686,807. This application Mar. 9, 1989, Ser. No. 321,645
Int. Cl.[5] E04B *5/48*
U.S. Cl. 52—219 9 Claims



1. A pre-fabricated and modular chimney facade system adapted to be secured to a roof having a predetermined pitch angle of a building structure comprising:

(a) a substantially vertically directed chimney stack passing through said building structure roof and being substantially enclosed by said chimney facade system; and,

(b) a substantially vertically directed base housing adapted to be fixedly secured to said roof, said base housing having a lower surface cut to said pitch angle of said roof and a channel formed in an upper section of said base housing extending throughout a periphery thereof, said base housing including an inclined upper surface adjacent said channel for directing liquid thereto.

5,003,740

OPEN OFFICE SYSTEM PARTITION PANEL ASSEMBLY

Raymond P. Dull, Spring Lake; Bernard R. Lavas, and William D. Baxter, both of Muskegon, all of Mich., assignors to The Shaw-Walker Company, Muskegon, Mich.

Filed Nov. 23, 1988, Ser. No. 275,718
Int. Cl.[5] E04H *1/06*
U.S. Cl. 52—239 4 Claims

1. An open office system partition panel assembly including:

a base,

a panel located above said base and having a framework,

said framework including interconnected top, bottom and end steel channels,

a core positioned inside said framework,

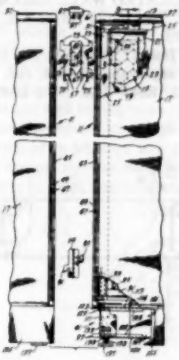
a covering on each exterior side of the framework in the core,

said top, bottom and end channels intersecting one another to form wire raceways around the periphery of the core, with wire non-sagging transitions between the channels,

the top channel opening outwardly and having a removable cap to permit wires to be laid therein,

said top channel including a pair of upstanding side walls, a laterally-extending lip formed on each side wall thereof, aligned openings formed in said lips along the lengths thereof, an elongated cover to close said top channel, said cover having a plurality of outwardly-extending tabs fitting into said openings in the lips to lock the cover to the top channel,

the end channels opening away from the core and having panel connector support rails closing their openings, and



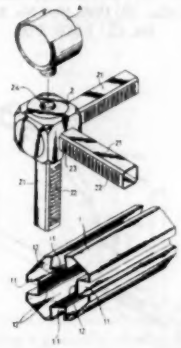
a leg positioned in said base at opposite ends of said panel, with said legs engaging and supporting said panel connector support rails of said end channels, with said panel connector support rails including bracket standards positioned along the opposite sides of the panel.

5,003,741

STRUCTURE OF MULTI-FUNCTION FRAME MEMBERS

Kuo-Huei Yeh, 70, Lane 184, Hu-Lin St., Taipei, Taiwan

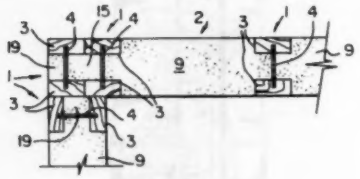
Filed Jun. 20, 1988, Ser. No. 208,599
Int. Cl.[5] E04B *1/343*
U.S. Cl. 52—280 12 Claims



1. A structure of multi-function frame members comprising a frame portion and a connector portion, wherein the frame portion comprises an octagonal tube having two or more outer sides each provided with a longitudinally extending dovetailed slot therein and having two pairs of mutually opposed longitudinal engaging surfaces extending along the inside of the tube and each engaging surface being provided with a plurality of longitudinal projections extending along the length of the tube; and wherein the connector portion comprises a support member having two or more sides each provided with a leg extending perpendicularly therefrom, the leg being provided with transverse projections thereon and engaging with the engaging surfaces of the tube, with the projections on the

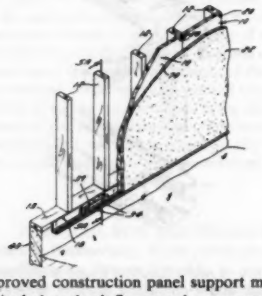
engaging surfaces of the tube and the projections on the legs being mutually perpendicular.

5,003,742
INSULATED WALL ASSEMBLY
Richard Dettbarn, 7803 G-35 Street S.E., Calgary, Alberta, Canada T2C 1V3
Filed Dec. 21, 1987, Ser. No. 135,641
Claims priority, application Canada, Jun. 1, 1987, 538453
Int. Cl.[5] E04B 7/02, 1/76; E04C 2/20
U.S. Cl. 52—282 6 Claims



1. An insulated wall assembly comprising spaced apart wooden post means of I-shaped cross section, each post means having front and rear surfaces and opposing recesses therebetween; and insulating panel means extending between and interconnecting said post means, said panel means including lateral projections for insertion into the recesses in said post means and front and rear surfaces coplanar with the front and rear surfaces of the post means in the assembled condition.

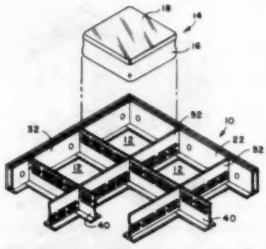
5,003,743
PANEL SUPPORT MEMBER AND SUPPORT ARRANGEMENT
Gabriel F. Bifano, Miami, and Erenio Reyes, Hialeah, both of Fla., assignors to Vinyl Corporation, Miami, Fla.
Filed Mar. 30, 1990, Ser. No. 502,432
Int. Cl.[5] E04B 5/00
U.S. Cl. 52—282 28 Claims



1. An improved construction panel support member of the type which includes a back flange and a support flange joined to the back flange, the support flange extending outward from the back flange at substantially 90 degrees and being adapted to support a panel, and the back flange being adapted for attaching the support member to a structure in an end-to-end relationship with a second support member attached to the structure, wherein forces disrupt the end-to-end relationship between the support members, the improvement comprising:

a channel joined to the support flange, the channel being engagable by a member engagable with the second support member.

5,003,744
GLASS-BLOCK PANELS WITH IMPROVED THERMAL CONDUCTION CHARACTERISTICS
John R. Taylor, Irving, Tex., assignor to Innovative Building Products, Inc., Grand Prairie, Tex.
Filed Jul. 31, 1989, Ser. No. 387,229
Int. Cl.[5] E04C 1/42
U.S. Cl. 52—308 5 Claims



1. A glass-block panel, comprising:

a perimeter formed from first and second pairs of interchangeable parallel longitudinal perimeter bars interlocked at ends thereof to form a peripheral border;

said perimeter bars each having a tubular rectangular cross-section including a top surface and a base, a plurality of longitudinally spaced vertical slots opening downwardly from said top surface, a longitudinal ridge formed at said top surface between said vertical slots, and a longitudinally extending lateral lip at said base protruding inwardly therefrom;

each of said first pair of said perimeter bars having end slots, said end slots being ones of said vertical slots located in close proximity to said ends thereof of said first pair of perimeter bars;

each of said second pair of said perimeter bars having internal recesses of bifurcated U-shaped formation at said ends thereof, with vertical underslots provided at each of said internal recesses for interfitting engagement with said end slots of said first pair of perimeter bars;

first and second pluralities of partition bars in cooperation with said peripheral border, said first plurality of partition bars extending parallel to and intermediate said first pair of perimeter bars, and said second plurality of partition bars extending parallel to and intermediate said second pair of perimeter bars, to form a grid-like pattern defining a plurality of individual recessed pockets;

each said partition bar including a longitudinal flat stock member, an upper edge, a transverse flange, and two ends, with said flange providing dual lateral shelf lips on each side of said flat stock member;

each of said first plurality of partition bars having a plurality of longitudinally spaced vertical slots extending downwardly from, and open at, said upper edge, and having an underside vertical slot at each of said ends interlocked with one of said slots of said second pair of perimeter bars;

each of said second plurality of partition bars having a plurality of spaced apart underside vertical slots interfitted with said vertical slots of said first plurality of partition bars, and having an underside vertical slot at each of said ends interlocked with one of said slots of said first pair of perimeter bars;

each of said first and second pluralities of partition bars including a plurality of walls defining rows of elongated thermal break slots in said flat stock members, said thermal break slots being spaced horizontally in each said row with gaps between adjacent ones thereof, said thermal break slots being long in a horizontal dimension, with said rows being spaced vertically and with said gaps being staggered vertically between adjacent rows of said slots;

said lips of said perimeter and partition bars being coplanar and defining a common shelf lip support plane within each of said pockets; and

a rectangular glass block inserted into each said pocket in contact with said shelf lips, with at least one compressed resilient stabilizing ring gasket interfitted between each said glass block and each said pocket to seal and stabilize said glass block within said pocket.

5,003,745

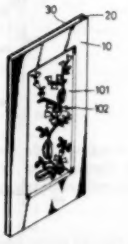
DOOR OF CONCAVITY SURFACE

Ho-Tsung Fang, P.O. Box 32-19, Kaohsiung, Taiwan

Filed Jan. 22, 1990, Ser. No. 468,231

Int. Cl.[5] B44F *11/00;* **B32B** *21/04;* **E04C** *2/24;* **E06B** *3/00*

U.S. Cl. 52—316 **1 Claim**



1. A door of concavity surface comprising:

a door board having at least a major side wall formed with at least a depressed portion;

at least a thermoplastic sheet attached to the major side wall of the door board and having a surface formed with at least a depressed portion to be fitted in the depressed portion of the major side wall of the door board; and

at least a pattern shaped in the depressed portion of the thermoplastic sheet below a level with the surface of the thermoplastic sheet.

5,003,746

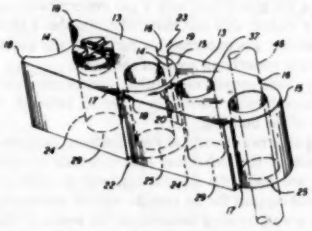
ARCUATE AND CURVILINEAR ASSEMBLIES COMPRISING TANDEMLY ARRANGED BUILDING BLOCKS HAVING DEGREES OF ROTATION

Arthur Wilston, Troy, Pa., assignor to Structural Block Systems, Inc., Troy, Pa.

Continuation of Ser. No. 267,903, Nov. 7, 1988, abandoned. This application May 31, 1990, Ser. No. 532,849

Int. Cl.[5] B37B *1/04*

U.S. Cl. 52—589 **11 Claims**



1. A wall assembly comprising a plurality of repeating building blocks successively arranged in a tandem array within a row, said wall assembly comprising a number of rows, each stacked one above another, said tandem arrays within each row facing in an opposite direction with respect to an adjacent row stacked above and below thereto, for the purpose of enhancing lateral forces such as those produced during an earthquake, each building block of said array being generally rectilinear with the exception of two oppositely disposed distal end walls having arcuate, circumferential male and female mating surfaces, respectively, each arcuate, circumferential male and female mating surface having a radial diameter almost equal to a width of said block to further enhance resistance to said lateral forces, each end wall being rotatively engageable with an arcuate mating end wall of an adjacent block of said assembly at any desired angle of rotation within a limited range of arc defined by circumferential end abutments terminating said arcuate mating surfaces of said mating end walls, each male end wall having means defining a hole for receiving vertical reinforcement, each hole being in registry with a hole of a block of an adjacent row stacked above and below thereto, said vertical reinforcement still further enhancing said wall assembly to resist lateral earthquake forces.

5,003,747

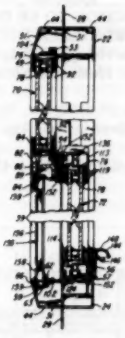
WINDOW ASSEMBLY OF EXTRUDED PLASTICS MATERIAL

Philip G. Morton, Germantown, Ohio, assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed May 1, 1989, Ser. No. 345,666

Int. Cl.[5] E04C *2/38*

U.S. Cl. 52—656 **20 Claims**



1. A window assembly adapted for use in a vertical wall of a building, comprising a generally rectangular frame supporting a generally rectangular light transmitting window unit, said frame including a pair of elongated vertical jamb members connected by a horizontal head member and a horizontal sill member, each of said members being formed from an extrusion of rigid plastics material, each of said jamb members including an outer portion integrally connected to an inner portion projecting inwardly into the frame from said outer portion, said outer portions of said jamb members having welded mitered corner joints with said sill member and said head member, and said inner portions of said jamb members having substantially right angle end surfaces abutting said horizontal head member and sill member for covering internal flash of said welded mitered corner joints.

5,003,748

METAL FRAME STRUCTURE

Noel R. Carr, Brisbane, Australia, assignor to Supertruss Pty. Ltd., Ashmore, Australia

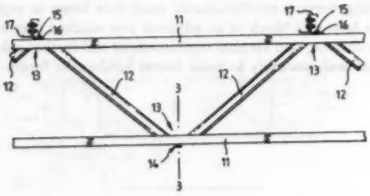
PCT No. PCT/AU88/00196, § 371 Date Jan. 10, 1990, § 102(e) Date Jan. 10, 1990, PCT Pub. No. WO88/10343, PCT Pub. Date Dec. 29, 1988

PCT Filed Jun. 20, 1988, Ser. No. 457,750

Claims priority, application Australia, Jun. 19, 1987, PI2569

Int. Cl.[5] E04C *3/02, 3/30*

U.S. Cl. 52—693 7 Claims



1. A frame joint for a truss including a pair of substantially parallel or spaced unitary chords and a plurality of elongated tubular webs secured to each chord by fasteners wherein said frame joint includes a junction of two webs and a respective chord wherein said webs include flattened end portions which overlap each other and an adjacent chord section so as to define at least three relatively narrow structural parts in transverse cross-section which are interconnected by a single pair of fasteners transversely aligned to a longitudinal axis of the adjacent chord.

5,003,749

GROUTING ANCHOR TO BE INSERTED IN A PREDRILLED HOLE

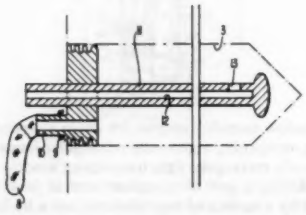
Alfons Harke, Affligem-Hekelgem, Belgium, assignor to International Intec Patent Holding Establishment, Vaduz, Liechtenstein

Filed Feb. 20, 1990, Ser. No. 481,615

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1989, 3905095

Int. Cl.[5] E04B *1/41*

U.S. Cl. 52—703 11 Claims



1. Grouting anchor insertable in a predrilled bore hole, the grouting anchor comprising a stopper means for sealing an opening of the predrilled bore hole an inlet opening means provided in said stopper means for receiving a grouting compound, at least one backflow opening means in said stopper means for accommodating the grouting compound, wherein said backflow opening means terminates into an air permeable forward collecting cage adapted to be separated from the means after a curing of the grouting compound.

5,003,750

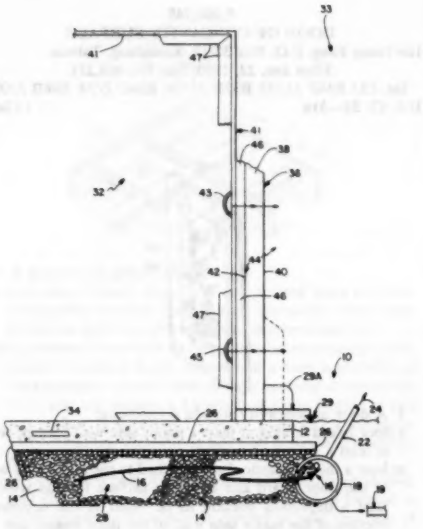
METHOD FOR REDUCING IMMUNOGENIC AND/OR TOXIC SUBSTANCES IN INDOOR AIR

Alex V. Delgado, 6732 N. Hillpark Ave., Parker, Colo. 80134

Filed Nov. 16, 1989, Ser. No. 437,671

Int. Cl.[5] E04B *1/00, 1/70;* E02D *17/02;* E04F *17/00*

U.S. Cl. 52—742 6 Claims



1. A method of constructing a building in order to minimize levels of immunogenic substances in the atmosphere contained in the building, wherein a portion of an overall construction process for the building employs a subprocess of construction comprising:

excavating an area of the earth upon which the building will be placed;

laying a gravel bed in the excavated area of the earth and thereby defining a gas permeable path over which gases emanating from underlying areas of the earth can be directed;

surrounding the gravel bed with a pipe having perforations in fluid connection with the gas permeable path defined by the gravel bed;

venting the pipe to the atmosphere;

covering the gravel bed with a gas impermeable material in such a manner that said material establishes a substantially monolithic, gas impermeable barrier to any gases emanating from underlying areas of the earth;

pouring a substantially monolithic layer of concrete over the gas impermeable barrier in order to establish a ground floor of the building;

erecting an array of vertical joist elements, (wherein a major fraction of the individual joist elements comprising the array are made of a metallic material) in order to provide vertical support for an outside wall of said building;

placing a wall forming material on the inside of the vertical joists, and

placing a layer of a metallic, gas impermeable material on the inside of the exterior wall;

electrically grounding the metal studs and metallic, gas impermeable material; and

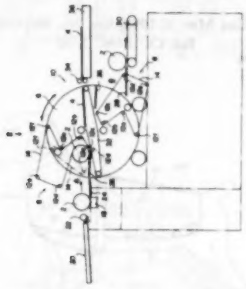
covering the layer of gas impermeable material with sheets of dry wall in order to form an inside wall surface.

5,003,751

PACKAGING SYSTEM

Akira Ishikawa, and Kazumasa Harada, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 4, 1989, Ser. No. 444,904
Claims priority, application Japan, Dec. 5, 1988, 63-307429
Int. Cl.[5] G65B 11/30
U.S. Cl. 53—215 4 Claims



3. A packaging system which wraps a sheet material around an article supplied at an article supply station and discharges the article at a discharge station, the packaging system comprising

a turret,

means for rotating said turret by 180°,

a pair of article wrapping means provided on the turret at an interval of 180° from each other, each of said article wrapping means for wrapping sheet material around an article while the article wrapping means rotates from the article supply station to the article discharge station, wherein each article wrapping means is alternately positioned at the article supply station and the article discharge station when the turret is stopped,

a sheet supply means for supplying the sheet material to the article wrapping means including,

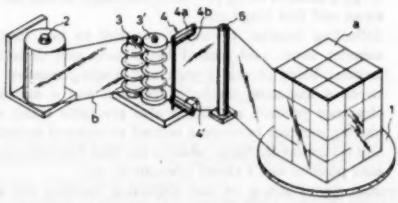
supply conveyor means for accepting sheet material at one side of the turret and for delivering the sheet material to the article wrapping means at the opposite side of the turret, said supply conveyor means mounted on the turret such that said turret may begin rotating before the conveyor means has delivered the sheet to a wrapping means without interrupting delivery of the sheet.

5,003,752

WRAPPING METHOD AND APPARATUS

Ryozo Matsumoto, 239-9, Oaza-Tanaka, Sasaguri-cho, Kasuya-gun, Fukuoka-ken, 811-24, Japan

Filed May 15, 1989, Ser. No. 351,585
Claims priority, application Japan, May 16, 1988, 63-119978; Sep. 14, 1988, 63-231000
Int. Cl.[5] B65B 11/04
U.S. Cl. 53—399 5 Claims



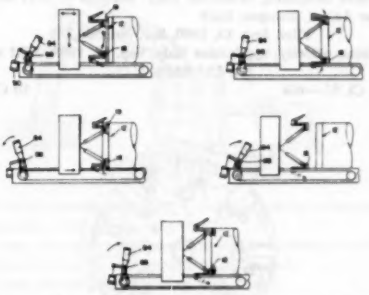
1. A method for wrapping a load with a wrapping plastic film from its roll, by creating relative rotation between said roll of film and the load to extract said film from said roll of film onto the load, said method comprising: preparing a pair of stretching rolls having vertical axes and disposed between said load and said roll of film, said stretching rolls having alternate peripheral ridges and peripheral grooves and being arranged such that the peripheral ridges on each stretching roll mesh with the peripheral grooves on the other stretching roll, passing said film extracted from said roll of film between said meshed stretching rolls, simultaneously stretching said film laterally and longitudinally by rotating said stretching rolls at different speeds and wrapping said load with said stretched film just after stretching thereof and spreading said film laterally between said stretching rolls and said load to widely wrap said load with the spread and stretched film.

5,003,753

INSIDE HEAD INSERTING APPARATUS AND METHOD

Norman E. Dornblaser, Elma, Wash., and David F. Hildermann, Portland, Oreg., assignors to Haines & Emerson, Inc., Hoquiam, Wash.

Filed Dec. 15, 1989, Ser. No. 451,195
Int. Cl.[5] B65B 51/00, 61/00
U.S. Cl. 53—415 22 Claims



1. A method of securing an oversized, lightweight, flexible head to the inside of a wrapper tube extension of a partially wrapped roll at a first station, the steps comprising:

holding the head at multiple spaced locations about an axis of the head;

axially moving the held head into engagement with an end of a partially wrapped roll inside a wrapper tube extension;

radially moving the multiple holding locations of the head outwardly until adjacent the wrapper tube extension; and

securing the head to the wrapper tube extension.

5,003,754

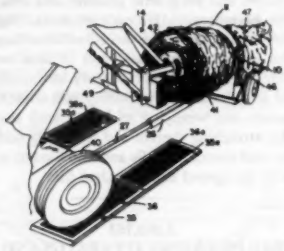
AGRICULTURAL BALE SHEATHING APPARATUS AND METHOD

William Stirling, P.O. Box 202, Lower Nicola, B.C., Canada V0K 1Y0

Filed Jan. 16, 1990, Ser. No. 465,484
Claims priority, application Canada, Jan. 19, 1989, 588681
Int. Cl.[5] B65B 9/10, 43/42
U.S. Cl. 53—459 14 Claims

12. A method of loading at least one bale of an agricultural product into a flexible bag carried by a sheathing device by means of a loading vehicle separate from the sheating device, said vehicle having a loading device and ground engaging means upon which said vehicle moves, said sheathing device comprising a drum for carrying the flexible bag and immobilizing means for immobilizing the sheathing device during loading, comprising holding open a mouth of the bag with the drum and loading each bale into the bag through the drum by means of the loading device of the loading vehicle, characterised by immobilizing the drum during the loading operation by

moving the ground engaging means to overlie said immobilizing means to immobilize said sheathing device by the weight of



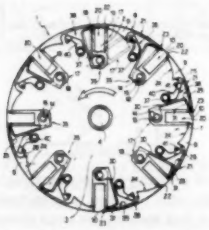
the vehicle, while maintaining the bale movable relative to the drum for loading the bale into the bag through the drum.

5,003,755

METHOD AND DEVICE FOR PRODUCING TUBULAR WRAPPINGS

Florenzo Draghetti, Medicina, Italy, assignor to G.D Societa' Per Azioni, Bologna, Italy

Filed Aug. 13, 1990, Ser. No. 566,265
Claims priority, application Italy, Sep. 14, 1989, 3622 A/89
Int. Cl.[5] B65B *11/32*
U.S. Cl. 53—466 10 Claims



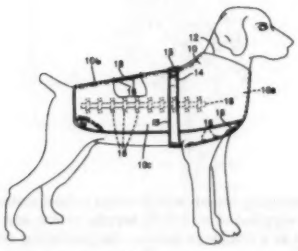
1. A method of producing tubular wrappings (49) for products (2) of substantially parallelepiped shape; said method comprising stages consisting in successively feeding sheets (46) of wrapping material over respective peripheral openings (10) formed on a wrapping wheel (1) and enabling access to respective seats (20) formed on said wheel (1); feeding said products (2) successively, and in a substantially radial direction, through respective said openings (10) and into respective said seats (20), insertion of each said product (2) being accompanied by simultaneous insertion of the respective said sheet (46), which is folded in a U about said product (2) inside said seat (20), with two opposite portions (47, 48) projecting outwards of said opening (10); successively folding said two portions (47, 48) about said product (2), so that a second (48) of said portions at least partially overlaps a first (47) of said portions; and stably connecting said two overlapping portions (47, 48) via joining means (36); characterised by rotating said wheel (1) at substantially constant speed about its axis, moving a seat holder element (17) on said wheel and on which element said seat carrying a product and wrapping sheet is mounted in relation to the wheel between a first position, wherein said seat (20) faces substantially radially outwards of said wheel (1), and a second position wherein said seat (20) is aligned with respective said joining means (36) supported on said wheel (1) folding said second portion (48) being folded by moving the respective said seat holder element (17) into said second position, and via interference with folding means (9) supported in a fixed position on said wheel (1) and sealing said projecting portions with said joining means on said wheel while said seat holder is in said second position.

5,003,756

DOG GARMENT WITH FLEA REPELLING MEANS

Joseph A. Maxzotta, Sr., 1970 Lawaridge St., Medford, Oreg. 97504

Filed Mar. 8, 1990, Ser. No. 490,445
Int. Cl.[5] B68C *5/00*
U.S. Cl. 54—79 1 Claim



1. A dog garment comprising:

a coat having a size arranged to cover the chest of the dog and a portion of the neck and also to cover the sides and back of the dog,

means on said coat arranged to hold it in place on a dog,

said coat having an inner surface in engagement with the body of the dog,

and a plurality of elongated flea repelling strips and a plurality of holders for said flea strips mounted on the inner surface of said coat and each including a plurality of cross loops,

said loops for each strip being in alignment and arranged to removably hold one of said strips,

said loops being spaced from each other to expose said strip to the dog.

5,003,757

CLOSE-TRIM MOWER DEFLECTOR

Amos G. Hill, Orangeburg, S.C., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Jan. 23, 1990, Ser. No. 468,755
Int. Cl.[5] A01D *34/67*
U.S. Cl. 56—17.4 10 Claims

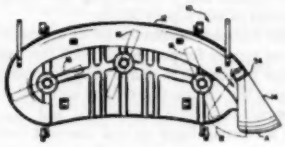
1. A close-trim deflector for a mower, said deflector comprising:

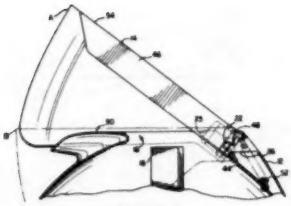
a hinging member having first and second hinge axes, said hinging member being pivotably attachable to said mower about said first hinge axis;

a deflecting member pivotably attached to said hinging member about said second hinge axis, said deflecting member being pivotable with said hinging member between a maximum discharge position and a minimum clearance position and being also pivotable about said hinging member between a normal orientation including said maximum discharge position and said minimum clearance position and a raised orientation; and

biasing means acting on said deflecting member and said mower to urge said deflecting member toward said maximum discharge position, said biasing means also acting to urge said deflecting member toward said normal orienta-

tion, wherein said hinging member comprises a T-shaped member having a shaft portion and a cross portion, said





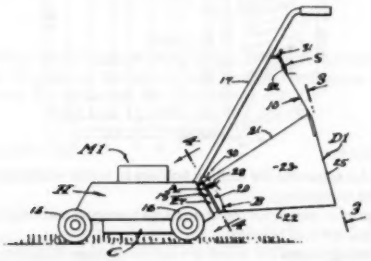
shaft portion and said cross portion acting as said first and second hinge axes, respectively.

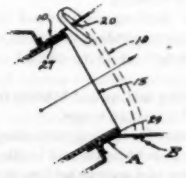
5,003,758

DISPOSABLE DEBRIS BAG FOR LAWNMOWERS AND SWEEPERS

Arnold Bernstein, 8915 Owensmouth Ave., Canoga Park, Calif. 91304

Filed Feb. 2, 1990, Ser. No. 474,493
Int. Cl.[5] A01D *34/70*
U.S. Cl. 56—202 **14 Claims**





1. A disposable bag for debris discharging machines having a rearwardly open debris discharge boot from which debris is forceably discharged, and including;

an envelope of flexible thin walled sheet material having a neck portion convergent to a collar portion defining an opening to slidably fit over the rearwardly opening discharge boot of the debris discharging machine,

a primary securement means carried by and for releasably securing the collar portion onto the discharge boot,

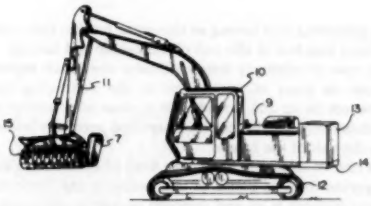
and a secondary securement means carried by the neck portion rearward of the collar portion for closing the envelope prior to release of the primary securement means.

5,003,759

BRUSH MOWER

John C. Brown, Goffstown, N.H., assignor to JCB Leasing Corp., Weare, N.H.

Filed Dec. 21, 1989, Ser. No. 454,696
Int. Cl.[5] A01D *25/08, 35/24*
U.S. Cl. 56—249 **11 Claims**



1. A brush mower head adapted to be carried by an articulating traveling crane comprising:

a casing, adapted to be mounted to said articulating traveling crane for travel over ground to be cleared;

a motor carried by said casing; and

a drum with a center shaft mounted for rotation in said casing about an axis of rotation and powered by said motor, said axis of rotation of said drum in use being generally parallel to said ground;

said drum:

being a cylinder having an inner wall and a length at least twice its diameter;

having at least two hammer shafts running end to end parallel to said axis of rotation and being in balanced relationship one to another to minimize rotational imbalance of said drum,

having interior circular reinforcing plates and end plates perpendicular to said axis of rotation and connected to said inner wall of said cylinder, said end plates having outer surfaces,

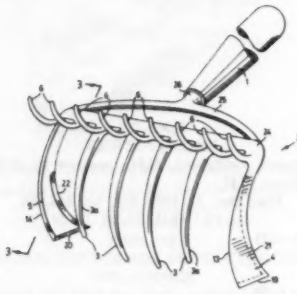
having a series of spaced apart outward facing interior semicircular plates about said hammer shafts affixed to said inner wall and to which of said reinforcing plates as are contiguous thereto, said semicircular plates defining wells about said hammer shafts,

being slotted at said wells, with slots associated with one hammer shaft being offset along the axis of said cylinder from those of another hammer shaft;

having hammers, each with a cutting edge and mounted on said hammer shafts for free rotation thereabout in each of said wells, said hammers when said drum is rotating for mowing protruding by centrifugal force through said slots beyond the surface of said cylinder and presenting the cutting edge of each of said hammers to the brush being engaged; and

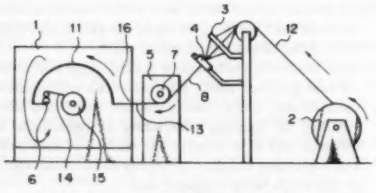
being dynamically balanced for rotation at at least 1,000 rpm.

5,003,760
GARDEN TOOL
Nancy A. Webb, R.R. #10, Brampton, Ontario, Canada L6V 3N2
Filed Oct. 24, 1989, Ser. No. 425,929
Int. Cl.[5] A01D 1/06
U.S. Cl. 56—400.06 10 Claims



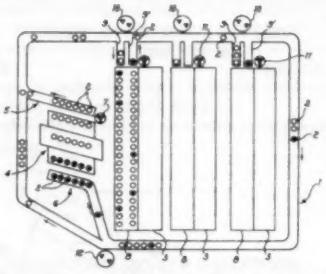
1. A gardening tool having an elongated handle; and a cultivator head attached at one end of the handle and having:
(a) a row of relatively long cultivator tines each tapering from its point of connection to the cultivating head towards its tip and extending in a plane of extension and substantially parallel to the others and generally inclined to the axis of the handle;
(b) a row of relatively short rake tines of even length each tapering from its points of connection to the cultivating head towards it tip and disposed parallel to the plane of extension of the cultivator tines, the tips of the rake tines extending in a direction substantially opposite to the tips of the cultivator tines; and
(c) a generally planar blade member connected on an end of the row of cultivator tines and extending substantially parallel to the cultivator tines and a plane of extension of the rake tines and substantially parallel to the handle, the blade member increasing in width downwardly from its point of connection to the cultivator head to its free end, whereby the blade member adjacent its lower end exposes blade edges spaced away form the cultivator tines in the direction longitudinally parallel to the handle.

5,003,761
METHOD AND APPARATUS FOR MANUFACTURING COMPACT CONDUCTORS
Kazuo Iura; Kazunori Tsuji, and Kazuhito Saka, all of Mie, Japan, assignors to Sumitomo Wiring System, Ltd., Mie, Japan
Filed Jul. 13, 1989, Ser. No. 379,630
Claims priority, application Japan, Jul. 18, 1988, 63-178670
Int. Cl.[5] D01H 1/04
U.S. Cl. 57—58.52 6 Claims



1. A method for manufacturing compact conductors, comprising the steps of:
supplying a plurality of conductor strands from a supply device;
converging and compacting said plurality of strands together to form a compact conductor by feeding said plurality of strands into a converging and compacting die downstream of said supply device;
feeding said compact conductor about a capstan having a peripheral groove formed therein such that said compact conductor is received in said groove downstream of said converging and compacting die and such that the shape of said compact conductor is preserved; and
imparting a twisting force to said compact conductor by feeding said compact conductor from said capstan downstream to a twist machine.

5,003,762
AUTOMATIC FEEDER AND FEEDING METHOD FOR TEXTILE MACHINES
Enzo Scaglia, 21, Via Monte Rosa, Milan, Italy 20149
Filed Jan. 17, 1989, Ser. No. 297,617
Int. Cl.[5] D01H 9/18; B65H 67/06
U.S. Cl. 57—281 16 Claims



1. An apparatus for feeding bobbins to textile machines, said device comprising,
transport means for the continuous transport and supply of a plurality of bobbins,
winding means for winding a length of sliver on empty ones of said plurality of bobbins,
marking means for marking said wound bobbins with a removable code corresponding to predetermined characteristics of said length of sliver carried on said wound bobbins,
an inlet for transferring said wound bobbins from said winding means to said transport means,
bobbin handling means for loading, unloading and positioning said plurality of bobbins on said textile machines,
a station for inserting said wound bobbins onto said bobbin handling means,
reading means at said inserting station for recognizing said code marked on said wound bobbins.
a station for removing said empty bobbins from said bobbin handling means, and
an outlet for transferring said empty bobbins from said transport means to said winding means.

5,003,763

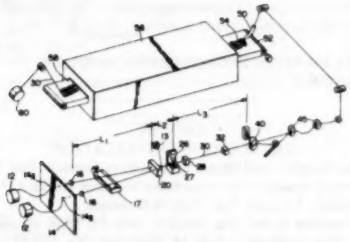
APPARATUS AND PROCESS FOR FORMING ALTERNATE TWIST PLIED YARN AND PRODUCT THEREFROM

Donald E. Hallam; Peter Popper, both of Wilmington, Del.; Harold F. Staunton, Avondale, Pa.; and Paul W. Yagye, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 322,623, Mar. 13, 1989, abandoned, which is a division of Ser. No. 188,559, Apr. 29, 1988, abandoned, which is a continuation-in-part of Ser. No. 181,847, Apr. 15, 1988, abandoned. This application Aug. 6, 1990, Ser. No. 563,836

Int. Cl.[5] D01H *13/28*

U.S. Cl. 57—297 4 Claims



1. A method for bonding fiber using an ultrasonically energized horn having a surface opposed to a surface of a movable anvil comprising:

ply twisting strands together;

placing the ply twisted strands between the horn and anvil;

applying tension to the strands;

continuously energizing the ultrasonic horn;

starting the bonding by applying pressure to the ply twisted strands by squeezing them between the horn and anvil;

and stopping the bonding by removing the pressure that was applied to the strands by squeezing.

5,003,764

NOZZLE TEXTURIZER FOR YARN MANUFACTURING

Jimmy D. Hosmer, Scottsboro, Ala., assignor to Hosmer Machinery & Engineering, Inc., Scottsboro, Ala.

Filed Oct. 13, 1989, Ser. No. 421,250

Int. Cl.[5] D01H *7/92*

U.S. Cl. 57—333 4 Claims

1. A nozzle texturizer comprising an elongated metal body in the form of a generally rectangular block made up of a pair of halves, each half having a surface adapted for mating with a surface of the other half and having a straight bore extending longitudinally therethrough, said bore including an upper tubular region having a diameter adapted to receive a plurality of extruded strands of synthetic fiber material, a middle tubular region communicating with the bottom of said upper region and having a larger diameter than said upper region, and a frustro-conical, downwardly disposed nozzle region for imparting kinking action to said strands when passed therethrough by action of heated compressed air and a plurality of air entry apertures communicating said bore near the junction of said upper and middle regions with the exterior of said body;

each said half block including a pair of apertures offset longituidinally from one another a distance of 0.030 inch at their junctures with said bore; and

one of said passageways in each of said halves being disposed at an angle of 45° with respect to the center line of said bore, and the other thereof being disposed at an angle of 43° with respect to said bore;

whereby, upon introduction of compressed air into the bore through said apertures, swirling action will be created, causing said strands to become twisted.

5,003,765

GUIDE OR FEEDER CHAIN

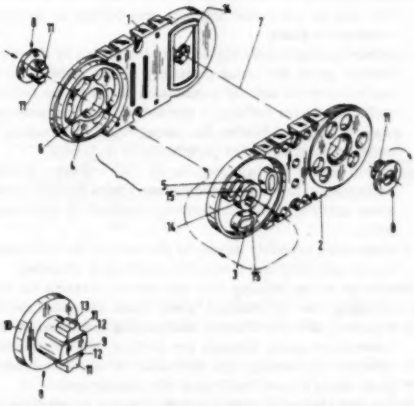
Werner Moritz, Siegen, Fed. Rep. of Germany, assignor to Kabelschlepp Gesellschaft mit beschränkter Haftung, Siegen, Fed. Rep. of Germany

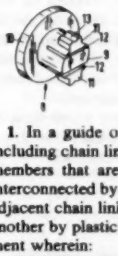
Filed Aug. 3, 1990, Ser. No. 562,633

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1989, 3928233

Int. Cl.[5] F16G *13/16*

U.S. Cl. 59—78.1 4 Claims





1. In a guide or feeder chain for power and supply lines, including chain links that each comprise two spaced-apart link members that are disposed parallel to one another and are interconnected by crosspiece means, whereby link members of adjacent chain links, where they overlap, are held against one another by plastic locking pins along pivot axes, the improvement wherein:

said locking pins each comprise a shaft having two ends, on one of which is formed a head, and on the other of which are formed radially projecting dogs that are disposed opposite one another;

each link member, concentric to one of said pivot axes, has a locking hole which has radial grooves for receiving said dogs, with said grooves, on one side of said link member, having undercuts that extend away from said groove in the circumferential direction of said locking hole for receiving said dogs;

said shafts of said locking pins are provided with axially extending slots to form radially resilient shaft portions on which said dogs are formed;

each dog has an outer surface in which is provided an axially extending groove; and

each link member, at an end of each of said undercuts remote

from said radial grooves thereof, is provided with respective bosses that correspond with said grooves of said dogs.

5,003,766

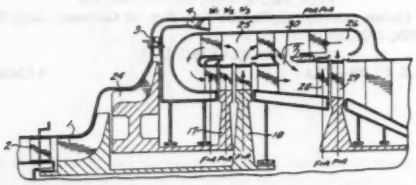
GAS TURBINE ENGINE

Marius A. Paul, 1100 E. Orangethorpe Ave., Ste. 140, Anaheim, Calif. 92801

Continuation of Ser. No. 924,136, Oct. 27, 1986, abandoned, which is a continuation-in-part of Ser. No. 659,328, Oct. 10, 1984, abandoned. This application May 8, 1989, Ser. No. 348,674

Int. Cl.[5] F02C 7/16

U.S. Cl. 60—39.15 17 Claims



1. A gas turbine engine comprising:

means defining an annular combustion chamber in which fuel and air are mixed together and burned to produce combustion gases;

a turbine having turbine blades rotatably driven by the combustion gases, the outer periphery of the turbine being encircled by the annular combustion chamber, the turbine including means defining a plurality of cooling passageways through its blades, the passageways terminating in outlet ports at the outer peripheries of its blades;

injection means for injecting liquid fuel into the turbine passageways for cooling the turbine blades and for subsequent entry into the combustion chamber via the outlet ports;

a compressor rotatably driven by the turbine, for compressing air and directing it into the combustion chamber;

discharge means defining first and second channels for discharging the combustion gases from the combustion chamber, the first channel discharging a portion of the combustion gases through the turbine, and the second channel discharging the remainder of the combustion gases along a path that bypass the turbine; and

regulating means for regulating the relative proportions of combustion gases that the discharge means discharges through the respective first and second channels.

5,003,767

GAS TURBINE STARTER SYSTEM WITH POWER AUGMENTATION

Colin Rodgers, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Continuation of Ser. No. 173,576, Mar. 25, 1988. This application Oct. 10, 1989, Ser. No. 470,006

Int. Cl.[5] F02C 7/27

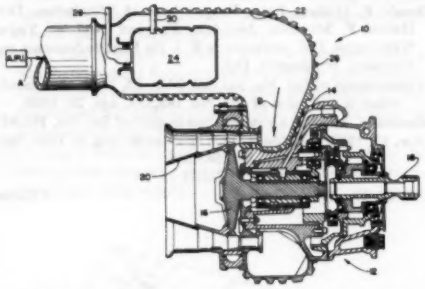
U.S. Cl. 60—39.142 14 Claims

1. A power augmented gas turbine starter system, comprising:

starter means including a casing rotatably mounting a turbine wheel therewithin;

low pressure air supply means communicating with the casing for providing a given volume of low pressure air directly to the starter means; and

combustor means associated with the low pressure air supply means for receiving only a portion of said given volume of low pressure air therefrom and supplying a flow of



hot gas to the starter means for augmenting the power thereof.

5,003,768

GAS TURBINE INSTALLATION

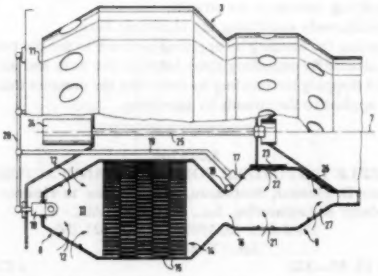
Guenter Kappler, and Dieter Rist, both of Munich, Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 285,018, Dec. 16, 1988, abandoned. This application Feb. 14, 1990, Ser. No. 480,377

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1987, 3742891

Int. Cl.[5] F02C 7/057

U.S. Cl. 60—39.23 30 Claims



1. A gas turbine installation operating on a two-stage combustion process, comprising:

a combustion chamber;

a compressor for providing a source of air to the combustion chamber;

a compressor drive turbine for driving the compressor;

a work turbine driving a rotary output shaft;

the combustion chamber burning fuel in the compressed air received from the compressor, being located downstream therefrom and upstream of the turbines, and being constructed as a two-stage combustion chamber with a catalyst having a ring shape for catalytic combustion in a first upstream stage connected to the compressor and a flame combustion in an annular stage downstream from the catalytic stage for burning fuel at a higher temperature than a temperature in the catalytic stage;

an interior wall of the downstream annular stage defining a closed surface except for air inlet openings which are selectively opened and closed;

the compressor providing compressed air for the second combustion state that by-passes the first combustion stage; and

a fuel supply for the second combustion stage;

wherein said air and fuel supply are located within an area defined by an inner wall of the downstream annular stage of the combustion chamber.

5,003,769

SELF-CHECKING SPEED GOVERNOR ARRANGEMENT

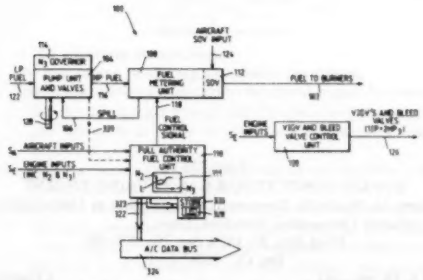
Hugh F. Cantwell, Derby, England, assignor to Rolls-Royce plc, London, England

Filed Jun. 23, 1989, Ser. No. 370,797

Claims priority, application United Kingdom, Jun. 30, 1988, 8815623

Int. Cl.[5] F02C 9/28

U.S. Cl. 60—39.281 14 Claims



1. A self-checking governor arrangement for controlling the rotational speed of a spool in a gas turbine engine, comprising:

a displaceable member;

a displacing device which effects displacement of the displaceable member by an amount which varies directly with said rotational spool speed;

a biasing device which contacts said displaceable member to act against said displacement of the displaceable member;

valve means for controlling fuel flow to the engine, the valve means being actuatable by the displaceable member to reduce fuel flow to the engine in dependence upon said displacement of said displaceable member;

switch means actuatable by said displacement of the displaceable member, the biasing device abutting said switch means over at least a portion of said displacement such that said switch means generates a switch signal indicative of when said displaceable member is displaced by a predetermined amount corresponding to a predetermined spool speed within a predetermined normal range of spool speeds experienced by said spool during normal operation of said engine;

sensor means for generating a spool speed signal whose valve varies with said rotational speed of said spool; and

data processing means connected to receive said switch signal and said spool speed signal, said data processing means being adapted to determine whether receipt of the switch signal substantially coincides with receipt of a value of the spool speed signal corresponding to said predetermined spool speed and to output a governor status signal dependent upon the result of said determination.

5,003,770

THRUST REVERSER FOR A JET ENGINE OF THE TYPE WITH DOORS EQUIPPED WITH AUXILIARY FLAPS

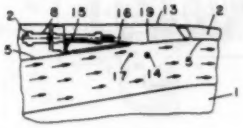
Robert Schegerin, Jouy en Josas; Bernard Laboure, Velizy, and Robert Standish, Gazeran, all of France, assignors to Societe de Construction des Avions Hurel-Dubois, Meudon la Foret, France

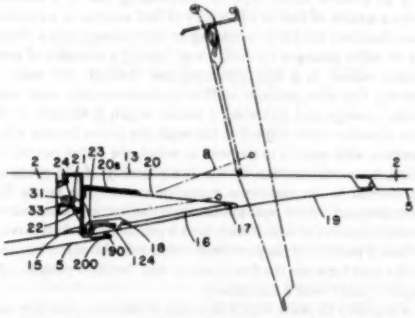
Filed Aug. 22, 1989, Ser. No. 397,126

Claims priority, application France, Aug. 29, 1988, 88 11325

Int. Cl.[5] F02K 1/70

U.S. Cl. 60—226.2 10 Claims





1. A thrust reverser for a jet engine of the type including an external cowling defining a flow channel for the propulsion jet, comprising:

(a) at least one tiltable door mounted on the cowling and movable between a closed position aligned with the cowling and a reversal position in which the door extends transversely to the flow channel for deflecting the propulsion jet, the door having a front deflector portion and an upstream door portion set back relative to the front deflector portion, said door being movable between an open position and a closed position, wherein in the closed position of the door the upstream door portion is offset with respect to the flow channel thus forming a vacuum zone;

(b) at least one flap articulated at a downstream end about a shaft mounted on an internal wall of the door for covering the vacuum zone and for being positioned, when the door is in its closed position, in alignment with the flow channel, and when the door is in the open position, retracted against the upstream door portion;

(c) alignment means for aligning the flap with a portion of the cowling defining the flow channel, said alignment means including a lever articulated to the door, one end of which lever cooperates with the flap and an opposing end of which lever cooperates with a stop carried by a fixed part of the cowling; and

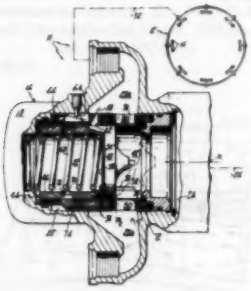
(d) resilient means for returning the flap to its retracted position against the door when the door is in the open reversal position.

5,003,771

FUEL DISTRIBUTION VALVE FOR A COMBUSTION CHAMBER

Jervis D. Kester, Farmington, and Clarence P. Redington, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 13, 1988, Ser. No. 257,490
Int. Cl.[5] F02C 7/264, 9/34
U.S. Cl. 60—243 14 Claims



1. In a valve of the type for distributing fuel in a machine from a source of fuel to a plurality of fuel nozzles in a combustion chamber, the valve including an inlet passage and a plurality of outlet passages for fuel, a wall having a plurality of ports which extend in a first direction and through the wall for placing the inlet passage in flow communication with each outlet passage and including a piston which is slidable in the first direction with respect to the wall, the piston having a first position with respect to the wall at which the piston covers the ports, a second position at which a plurality of the ports are uncovered to the maximum extent of uncoverage in the first direction and a third position between the first position and the second position at which each port is partially covered leaving at least a portion of the port uncovered over the entire distance of the port between the first position and the third position, the improvement which comprises:

a plurality of ports which includes at least one first port and more than one second port, the plurality of ports being uncovered at said third position with each port having an uncovered area, each first port having an uncovered area A_3 which is greater than the uncovered area A_{r3} of each of the second ports to provide a greater fuel flow through said area A_3 and thence to a region of the combustion chamber to provide a fuel rich region of the combustion chamber in comparison to other regions of the combustion chamber in flow communication with said source of fuel through said ports having an area A_{r3}.

5,003,772

TURBO HYDRAULIC UNITIZED ACTUATOR

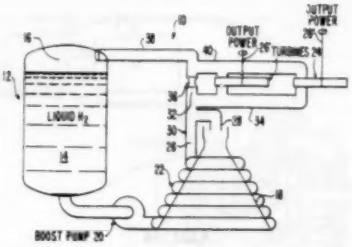
Jeffrey A. Huber, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 12, 1988, Ser. No. 256,864
Int. Cl.[5] F02K 9/50
U.S. Cl. 60—259 25 Claims

1. A propulsion system having a propulsion engine which combusts propellant received from a storage tank in which a portion of the tank contains propellant in a liquid state and in which an ullage in a remaining portion of the tank contains the propellant in a gaseous state comprising:

a first propellant circuit coupling liquid propellant stored in the portion of the tank storing the propellant in a liquid state to an evaporator for gasifying the liquid propellant;

a second propellant circuit including a first portion coupling the gaseous propellant from the evaporator to the propulsion engine for combustion by the engine and a second portion coupling gaseous propellant to the ullage; and



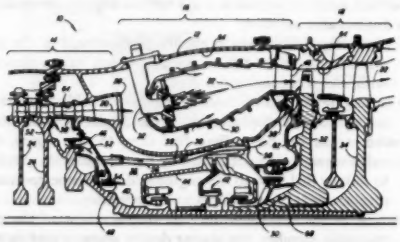
at least one power takeoff disposed in the second portion of the second propellant circuit for providing a power takeoff powered by energy of the gaseous propellant flowing in the second portion of the second propellant circuit.

5,003,773

BYPASS CONDUIT FOR GAS TURBINE ENGINE

Barry M. Beckwith, Coventry, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 23, 1989, Ser. No. 370,503
Int. Cl.[5] F02C 7/12
U.S. Cl. 60—262 4 Claims



1. In a gas turbine engine having a rotating compressor section with a final rotating stage, an annular combustor section, and a turbine section all disposed sequentially about a single axis and further including a low pressure compartment disposed radially inward of the compressor section and sealingly isolated from an annular flow of pressurized working fluid passing axially through the engine by an upstream pair of rotating seals disposed in series between the working fluid flow exiting the last compressor stage and non-rotating combustor section inlet, and by a downstream rotating seal disposed between the non-rotating combustor section outlet and a first rotating turbine stage, the upstream pair of rotating seals defining an annular seal compartment therebetween, where the improvement comprises:

means for venting leakage working fluid from the annular seal compartment to a point in the annular working fluid flow stream prior to the first turbine stage.

5,003,774

APPARATUS FOR SOOT REMOVAL FROM EXHAUST GAS

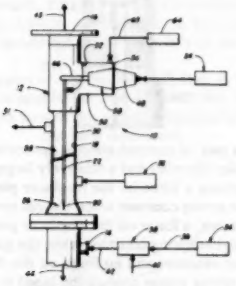
Robert E. Leonard, Oklahoma City, Okla., assignor to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 107,721, Oct. 9, 1987, Pat. No. 4,908,047. This application Oct. 27, 1989, Ser. No. 427,799

The portion of the term of this patent subsequent to Mar. 13, 2007, has been disclaimed.

Int. Cl.[5] F01N *3/02*

U.S. Cl. 60—275 5 Claims



1. An apparatus comprising:

a diesel engine producing an exhaust gas stream;

means operatively connected to the diesel engine for receiving the exhaust gas stream and for contacting the exhaust gas stream with water to produce a substantially water saturated gas stream;

means for electrically charging particles and droplets in the water saturated gas stream; and

means for electrostatically attracting and de-entraining soot and soot containing water droplets from the gas stream containing electrically charged particles and droplets to produce a substantially soot free exhaust gas stream; wherein the means for charging particles and droplets and the means for electrostatically attracting and de-entraining soot and soot containing water droplets further comprise:

a precipitator having a first outlet opening formed through a portion thereof, a second outlet opening formed through a portion thereof and spaced a distance from the first outlet opening, a flow opening extending a distance therethrough in communication with the first and second outlet openings, and an inlet opening formed through a portion thereof and being in communication with the flow opening and being spaced generally between the first and second outlet openings, the water saturated gas stream being passable into the flow opening by way of the inlet opening;

means for forming an ionizing zone in the flow opening generally near the inlet opening for charging particles and droplets in the water saturated gas stream to produce the gas stream containing the electrically charged particles and droplets, a portion of the gas stream containing electrically charged particles and droplets being passable through the flow opening and from the ionizing zone toward the first outlet opening and another portion of the gas stream containing the electrically charged particles and droplets being passable through the flow opening and from the ionizing zone toward the second outlet opening;

means for forming a first collection zone within the flow opening generally between the ionizing zone and the first outlet opening for attracting and de-entraining soot and soot containing water droplets in the gas stream containing electrically charged particles and droplets passing through the first collection zone to produce a first substantially soot free exhaust gas stream passable from the first collection zone through the first outlet opening; and

means for forming a second collection zone within the flow opening generally between the ionizing zone and the second outlet opening for attracting and de-entraining soot and soot containing water droplets in the gas stream containing electrically charged particles and droplets passing through the second collection zone to produce a second substantially soot free exhaust gas stream passable from the second collection zone through the second outlet opening.

5,003,775

SELF-SUCTIONING PISTON ENGINES

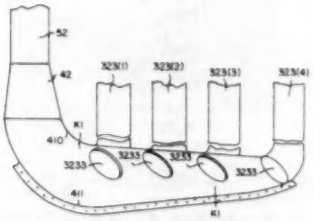
Hans K. Leistritz, Am Schroffen 8, D-7596 Seebach, Fed. Rep. of Germany

Filed Mar. 20, 1989, Ser. No. 325,993

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1988, 3905405

Int. Cl.[5] F02B *27/02*

U.S. Cl. 60—313 4 Claims



1. Apparatus for the discharge of waste gases in multicylinder piston engines, comprising:

an exhaust path of a tubular line shape for maintaining separate the discharge of each of the individual cylinders of the multicylinder piston engine, each exhaust path including an outlet;

an exhaust nozzle with an end portion formed by one of the outlets and sloping walls diverging from said end portion to another end portion terminating in a conical narrowing portion and the remainder of said outlets being spaced along the longitudinal axis of said exhaust nozzle extending between said end portions; and and

a pipe interconnecting said conical narrowing portion, and a muffler.

5,003,776

HYDRAULIC DRIVE SYSTEM

Takashi Kanai, Kashiwa; Masami Ochisi, Chiyoda; Morio Oshina, and Mitsuo Sonoda, both of Shimoinayoshi, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 127,275, Dec. 1, 1987, abandoned. This application Jul. 12, 1989, Ser. No. 378,493

Claims priority, application Japan, Dec. 1, 1986, 61-284378; Dec. 1, 1986, 61-284379

Int. Cl.[5] F16H *39/46*

U.S. Cl. 60—434 14 Claims

1. A hydraulic drive system for a vehicle having hydraulically powered wheels and a hydraulically powered work means, said hydraulic drive system comprising:

(a) an engine;

(b) a first hydraulic pump for running the wheels, said first hydraulic pump being provided with a displacement varying mechanism;

(c) a second hydraulic pump for running the work means, said second hydraulic pump being operatively connected to said engine;

(d) a hydraulic motor operatively connected to said first hydraulic pump;

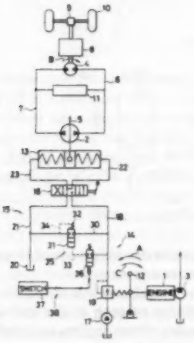
(e) a hydraulic actuator for actuating said displacement varying mechanism;

(f) an accelerator lever which is under the control of the operator of said hydraulic drive system and which is operatively connected to said engine so that the operator can set a target revolution number for said engine;

(g) a third hydraulic pump for feeding hydraulic fluid to said hydraulic actuator, said third hydraulic pump being operatively connected to said engine;

(h) a hydraulic fluid feeding means operatively connected between said third hydraulic pump and said hydraulic actuator so that a pressure increased responsive to an increase in the degree of operation of said accelerator lever can be transmitted together with hydraulic fluid to said hydraulic actuator;

(i) a low-pressure circuit operatively connected to said hydraulic actuator and to said hydraulic fluid feeding means and adapted to allow the hydraulic fluid from said third hydraulic pump to be discharged therethrough;



(j) a maximum pressure limiting means for bypassing the hydraulic fluid from said hydraulic fluid feeding means to said low-pressure circuit at a pressure value less than the maximum pressure value that said hydraulic fluid feeding means can output to said hydraulic actuator, whereby the maximum value of pressure to be fed to said hydraulic actuator can be limited; and

(k) actuating means under the control of the operator of said hydraulic drive system for selectively actuating said maximum pressure limiting means,

(l) whereby, when actuation of said maximum pressure limiting means is selected by said actuating means and the revolution number of each of said first and second hydraulic pumps is increased based on an increase in the revolution number of said engine by an operation of said accelerator lever, the delivery rate of said second hydraulic pump increases responsive to the increase in the revolution number of said engine, but the delivery rate of said first hydraulic pump is limited to a value less than the maximum pressure value that would otherwise be outputted responsive to a value set by said maximum pressure limiting means.

5,003,777

ASYMMETRIC GAS SPRING

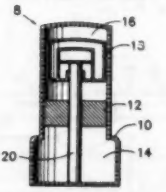
David M. Berchowitz, Athens, Ohio, assignor to Sunpower, Inc., Athens, Ohio

Filed Jun. 25, 1990, Ser. No. 544,196

Int. Cl.[5] F02G *1/045*

U.S. Cl. 60—520 **10 Claims**

2. In a free piston Stirling machine in which a displacer piston is slidably mounted in a cylinder formed in a housing and a gas spring applies a force to the displacer piston, an improved gas spring comprising a gas spring cylinder wall formed in a gas spring housing, a gas spring piston which is slidably mounted within the gas spring cylinder wall, and having at least one bleed hole formed in the gas spring cylinder wall at the center of the path of reciprocation of the gas spring piston which allows communication between the gas spring cylinder and a gas reservoir, and divides the gas spring cylin-



der wall into a pair of unequal volume gas spring chambers, a relatively smaller chamber and a relatively larger chamber, the gas spring applying a force on the displacer piston which is a function of one spring constant when the gas spring piston is in the larger chamber, a force on the displacer piston which is a function of a higher spring constant when the gas spring piston is in the smaller chamber and no force on the displacer piston while the gas spring piston crosses the bleed hole.

5,003,778

STIRLING ENGINE

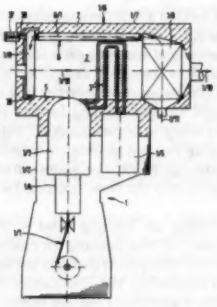
Anton Erber, Mühlhausen; Heinz Hoff, Königsbrunn; Günter Reuchlein, Augsburg; Hanno Schaaf, Friedberg, and Gerhard Schiessl, Augsburg, all of Fed. Rep. of Germany, assignors to Man Technologie Aktiengesellschaft, Munich, Fed. Rep. of Germany

Division of Ser. No. 269,639, Nov. 10, 1988, Pat. No. 4,953,354. This application Mar. 8, 1990, Ser. No. 490,739

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1987, 3709926; Feb. 26, 1988, 3806114

Int. Cl.[5] F02G *1/055*

U.S. Cl. 60—517 **20 Claims**



1. The combination of a Stirling cycle engine having a power unit (1/1) including an engine housing (1/2) and a cylinder (1/3)

with

a heater system (1/6) arranged for ducting combustion air, said heater system comprising

a heater system housing (1/7) coupled to said engine housing (1/2);

a thermally insulating lining (8) inside at least part of said heater system housing;

a heater (1/6) located in said heater system housing (1/7),

a burner (1/8);

a combustion air preheater (1/9) through which combustion air (1/11) for said burner passes and through which, further, combustion gases (1/10) from said burner pass for preheating the combustion air; and

a combustion air ducting means (6/1) connected between said preheater (1/9) and the burner (1/8), and

wherein said combustion air ducting means includes

a plurality of tubes or pipes (6/1) located in at least one layer adjacent each other to form a wall structure interiorily of said heater system housing.

5,003,779

GEOTHERMAL ENERGY CONVERSION SYSTEM

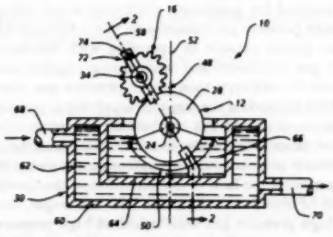
David Goldstein, Adelphi, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 444,350, Dec. 1, 1989, Pat. No. 4,938,026. This application Jun. 18, 1990, Ser. No. 539,942

The portion of the term of this patent subsequent to Feb. 3, 2007, has been disclaimed.

Int. Cl.[5] F03G *7/06*

U.S. Cl. 60—527 **16 Claims**



1. In combination with a source of heat energy, means for converting the heat energy into electrical energy including: a pair of gears and frame means mounting said gears for rotation in operatively orientated relation to said source, one of said gears comprising a tubular element rotatably mounted by the frame means for exposure to the source of heat energy within a thermal heating region, said tubular element including deformable means in meshing engagement with the other of the gears within a thermally colder region for inducing rotation of the gears.

5,003,780

FLUIDIC VALVE MECHANISM

Ronald L. Shellhause, 519 Bennert, Vandalia, Ohio 45377

Filed Dec. 28, 1989, Ser. No. 458,315

Int. Cl.[5] B60T *11/26;* **F15B** *7/08*

U.S. Cl. 60—585 **17 Claims**

1. A fluid flow sensitive valve assembly comprising:

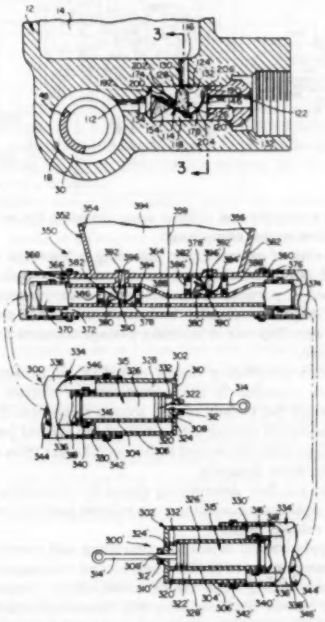
a housing having a valve mechanism received in a valve chamber formed in said housing, said valve chamber having a cylindrical side wall and axially spaced end walls and first and second ports respectively opening through said end walls and a third port opening through a valve seat formed in said cylindrical side wall at a point axially intermediate said end walls;

said valve mechanism including a valve member located partially within said valve seat and movable relative thereto into seated and unseated positions to respectively close and open said third port;

valve member positioning means pivotally mounted on said valve member and movable with said valve member as said valve member moves between its seated and unseated positions relative to said valve seat;

said valve member and said valve member positioning means having valve mechanism position location points thereon engagable with said valve chamber side wall and one of said valve chamber end walls for locating said valve mechanism in said valve chamber so that said valve member is unseated from said valve seat when there is no fluid flow through said valve chamber and also when there is fluid flow from said second port to said first port through said valve chamber, and said valve member is seated on said valve seat to close said valve seat and said third port when there is fluid flow from said first port to said second port through said valve chamber;

and fluid flow-impinging surfaces on said valve mechanism acting when fluid flow impinges thereon from said first port to said second port to move said valve mechanism from the valve member unseated position to the valve member seated position relative to said valve seat and acting when fluid flow impinges thereon as fluid flows toward said first port in said valve chamber from at least one of said second and third ports to move said valve mechanism from the valve member seated position to the valve member unseated position relative to said valve seat.



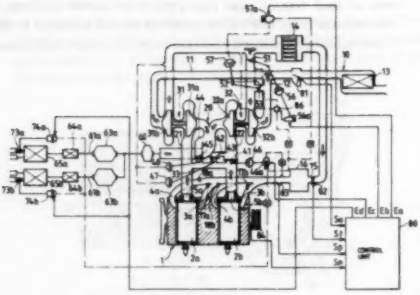
6. A fluid flow sensitive valve mechanism positioned in a valve chamber between first and second inlet-outlet ports opening into said valve chamber, said valve mechanism having a valve member controlling the opening and closing of a third inlet-outlet port opening into said valve chamber by being moved from a third port-opened position to a third port-closed position in response to the flow of fluid into the valve chamber from said first port which impinges on first surface means of said valve mechanism and being moved from the third port-closed position to the third port-opened position in response to the flow of fluid into the valve chamber toward said first port which impinges on second surface means of said valve mechanism, said valve mechanism further having valve mechanism positioning means engagable with at least one wall of said valve chamber while fluid flow is passing through said valve chamber to position said valve member relative to said third port and to pos-tion said first and second surface means of said valve mechanism for fluid flow impingement thereon.

5,003,781

AIR SUPPLY AND EXHAUST CONTROL SYSTEMS FOR TURBOCHARGED INTERNAL COMBUSTION ENGINES

Masanori Shibata, Hiroshima; Haruo Okimoto, Aki; Toshimichi Akagi, Hiroshima, and Seiji Tashima, Aki, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed May 18, 1989, Ser. No. 353,752
Claims priority, application Japan, May 23, 1988, 63-125418
Int. Cl.[5] F02B 37/12
U.S. Cl. 60—600 17 Claims



1. An air supply and exhaust control system for an internal combustion engine comprising:

a plurality of superchargers including at least first and second turbosuperchargers having respective turbines disposed in portions of an exhaust passage connected with the engine in parallel with each other and respective blowers disposed in an intake passage connected with the engine,

operation prohibiting means including an exhaust cutoff valve provided in the portion of the exhaust passage wherein the turbine of said second turbosupercharger is disposed for closing the portion of the exhaust passage so as to prohibit the second turbosupercharger from working as occasion demands,

exhaust gas flow determining means for generating an output signal corresponding to an exhaust gas flow amount in the exhaust passage,

air supply control means for controlling said operation prohibiting means to prohibit said second turbosupercharger from working when the detection output obtained from said exhaust gas flow detecting means indicates that the exhaust gas flow is less than a first predetermined value,

exhaust gas discharging means connected to a portion of the exhaust passage downstream of the turbine of said first turbosupercharger having a variable exhaust resistance for discharging the exhaust gas from the exhaust passage,

exhaust resistance changing means for changing the variable exhaust resistance of said exhaust gas discharging means, and

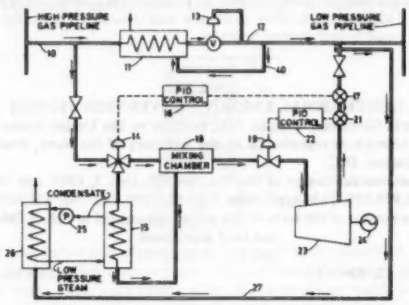
exhaust control means for controlling said exhaust resistance changing means to set the variable exhaust resistance of said exhaust gas discharging means to be relatively large when the detection output obtained from said exhaust gas flow detecting means indicates that the exhaust gas flow is less than a second predetermined value which is smaller than said first predetermined value and to be relatively small when the detection output obtained from said exhaust gas flow detecting means indicates that the exhaust gas flow is equal to or more than the second predetermined value.

5,003,782

GAS EXPANDER BASED POWER PLANT SYSTEM

Zoran Kucerija, 46 Butternut Dr., Pittsford, N.Y. 14534

Filed Jul. 6, 1990, Ser. No. 549,090
Int. Cl.[5] F01K 25/10
U.S. Cl. 60—648 3 Claims



1. A method for generating electricity where gas pressure from a high pressure gas transmission line is reduced with a gas expander system capable of operating with fluctuating high pressure gas conditions and maintaining required outlet gas conditions for delivery to a lower pressure gas distribution line, which comprises the steps of supplying a portion of the lower pressure gas to the combustion apparatus of a steam generator, heating feedwater in said steam generator and producing a low pressure steam, condensing the steam in a heat exchanger using the heat of condensation of the steam to heat a portion of high pressure gas in a heat exchanger, mixing the heated high pressure gas with unheated high pressure gas in proportion to controlled variable requirements, reducing the pressure of the combined high pressure gas by passing the gas through a gas expander which produces useful shaft power for driving an electrical generator or for mechanical drive applications.

5,003,783

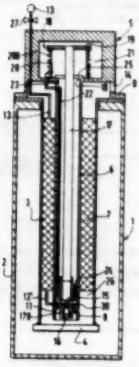
JOULE-THOMSON COOLER

Serge Reale, Grenoble, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Mar. 15, 1990, Ser. No. 493,706
Claims priority, application France, Mar. 15, 1989, 89 03383
Int. Cl.[5] F25B 19/02
U.S. Cl. 62—51.2 16 Claims

1. A Joule-Thomson cooler comprising, in a tubular housing having a first end and a second end, said second end defining a cold chamber, a high pressure working gas conduit having, adjacent said first end, one end connectable to a source of high pressure working gas, and which communicates, adjacent said second end, with an expansion orifice formed in a seat of a closing valve and opening in a low pressure working gas return circuit in heat exchange relationship with the high pressure working gas conduit, a closure member adapted for cooperation with the expansion orifice for reducing the section of passage of the working gas, and actuating means for suddenly shifting the closure member from a first position, in which said expansion orifice is uncovered, to a second position in which said expansion orifice is at least partially covered by said closure member, the actuating means comprising, adjacent said second end, a first capacity means having a first volume and in thermal exchange relationship with the low pressure return circuit and, adjacent said first end, a second capacity means having at least one movable wall portion and having a second volume much greater than the first volume, said first and

second capacity mans being in fluid communication with each other and being filled with an auxiliary gas, said movable wall



portion being coupled to said closure member for actuating said closure member.

5,003,784

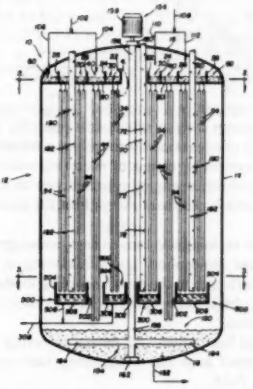
APPARATUS AND METHOD OF PRODUCING AN ICE SLURRY AT THE TRIPLE POINT OF A SOLUTION

Gerald E. Engdahl, Wheaton, Ill., and Tushar K. Shah, Houston, Tex., assignors to Chicago Bridge & Iron Technical Services Company, Oak Brook, Ill.

Filed Mar. 21, 1990, Ser. No. 496,940

Int. Cl.[5] B01D *9/04;* **C02F** *1/22*

U.S. Cl. 62—124 **25 Claims**



1. Apparatus comprising:

an enclosed vessel in which an ice slurry can be produced at the triple point of an aqueous solution;

a series of spaced apart aqueous liquid cooling surfaces in the vessel;

a series of spaced apart aqueous liquid contact surfaces arranged in substantially alternating arrangement between the cooling surfaces;

inlet means to feed an aqueous feed liquid into the vessel and to the feed liquid contact surfaces;

inlet means to feed a cold liquid coolant into the vessel to cool the cooling surfaces; and

outlet means to remove an ice slurry from the vessel.

5,003,785

AIR-CONDITIONING SYSTEM FOR A VEHICLE

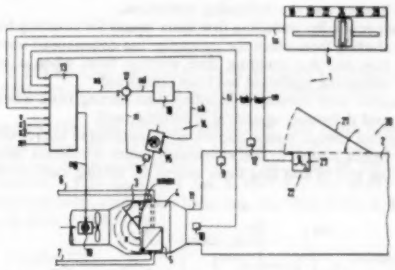
Horst Petri, Weissach-Flacht, and Michael Mönig, Hemmingen, both of Fed. Rep. of Germany, assignors to Dr. Ing h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 22, 1989, Ser. No. 454,859

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1988, 3843898

Int. Cl.[5] F25B *49/00;* **B60H** *1/32*

U.S. Cl. 62—131 **10 Claims**



1. An air-conditioning system for a vehicle having closable vehicle body openings, a passenger compartment of the vehicle being heatable by an air flow of a controllable temperature supplied by the air-conditioning system, the air-conditioning system comprising:

interior temperature control means for controlling the temperature of the air flow in an interior temperature control mode as a function of a deviation of an interior temperature of the passenger compartment of the vehicle determined by an interior temperature sensor from a given desired temperature,

blow-out temperature control means for controlling the temperature of the air flow in a blow-out temperature control mode as a function of a deviation of a blow-out temperature of air provided by the air-conditioning system and a desired temperature, and

switching means for detecting a condition of an opened vehicle body opening and for switching the air-conditioning system from the interior temperature control mode to blow-out temperature control mode wherein the temperature of the air flow is controlled as a function of a deviation of a blow-out temperature of air provided by the air-conditioning system and a desired temperature.

5,003,786

REFRIGERATING APPARATUS

Kanji Fudono; Hiroshi Ogawa; Toshimasa Takahashi, and Toshio Yamashita, all of Aichi, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1990, Ser. No. 477,764

Claims priority, application Japan, Apr. 7, 1989, 1-40521[U]

Int. Cl.[5] F25B *49/02;* **F25D** *21/06*

U.S. Cl. 62—156 **1 Claim**

1. Refrigerating apparatus comprising:

a refrigerant circuit including a compressor, a condenser, a throttle and an evaporator operatively connected to one another in series so as to sequentially receive refrigerant flowing through the circuit in the apparatus;

a compartment to which said refrigerant circuit is operatively connected;

evaporator fan means operatively associated with said evaporator for circulating air through said compartment and past said evaporator so as to effect a cooling operation in which the air in the compartment is cooled in the apparatus;

electric heater means, including an electric heater, operatively associated with said evaporator for facilitating a

heating operation in which air in the compartment is heated in the apparatus and for heating any frost adhered to said evaporator to effect a defrosting operation in the apparatus;

an overheating preventing temperature detector for detecting the temperature of air in the vicinity of said electric heater;

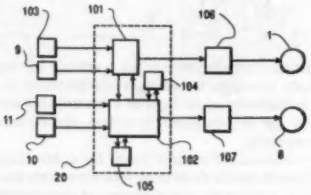
an evaporator outlet refrigerant detector for detecting the temperature of the refrigerant at the outlet of said evaporator; and

a controller for effecting refrigerating cycles in the apparatus which include respective ones of the cooling, the heating and the defrosting operations,

said controller including first timer means for counting time starting from when the controller has commenced operation and for counting time starting from when a said defrosting operation has been completed,

second timer means for counting time starting from when a said defrosting operation is initiated, and

defrost control means operatively connected to said electric heater means, to said evaporator outlet refrigerant detector and to said first timer means for turning said electric



heater on to initiate a said defrost operation once said first timer means has counted a predetermined period of time T_1 if the temperature detected by said evaporator outlet refrigerant detector is less than a predetermined temperature STE1, for turning said electric heater off to terminate a said defrost operation when said second timer means has counted a predetermined period of time T_2, and for turning said electric heater off to terminate a said defrost operation if the temperature detected by said evaporator outlet refrigerant detector is greater than a predetermined temperature STE2,

said defrost control means also operatively connected to said overheating preventing temperature detector for turning said electric heater on to initiate a said defrost operation once said first timer means has counted said predetermined period of time T_1 and if the temperature detected by said overheating preventing temperature detector is less than a predetermined temperature STHK1, and for turning said electric heater off to terminate a said defrost operation if the temperature detected by said overheating preventing temperature detector is greater than a predetermined temperature STHK2.

5,003,787

CELL PRESERVATION SYSTEM

Yury Zlobinsky, Massapequa, N.Y., assignor to Savant Instruments, Farmingdale, N.Y.

Filed Jan. 18, 1990, Ser. No. 466,853
Int. Cl.[5] F25D *17/02*
U.S. Cl. 62—185 **11 Claims**

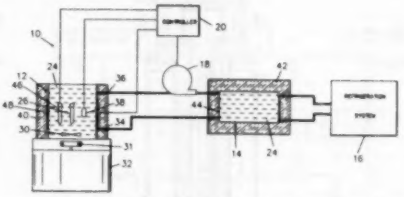
1. A system for cooling a specimen comprising:

a specimen vessel in which the specimen to be cooled is received;

a sealed coolant reservoir;

a coolant in said specimen vessel and said coolant filling said reservoir, said specimen vessel having an open top whereby the coolant therein is exposed to ambient environment;

means for circulating a flow of said coolant between said specimen vessel and said coolant reservoir whereby an inflow of coolant from said specimen vessel to said coolant reservoir at a first reservoir location causes an outflow of coolant from a second reservoir location as a return flow to said specimen vessel;



means for cooling said coolant in said coolant reservoir; and

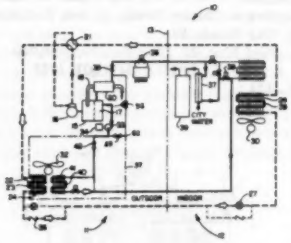
means for controlling said means for circulating to attain a predetermined rate of cooling of said specimen in said specimen vessel.

5,003,788

GAS ENGINE DRIVEN HEAT PUMP SYSTEM

Robert D. Fischer, Columbus, Ohio, assignor to Gas Research Institute, Chicago, Ill.

Filed Sep. 5, 1989, Ser. No. 402,660
Int. Cl.[5] F25B *27/00*
U.S. Cl. 62—238.7 **6 Claims**



1. A heat pump system selectively operable in cooling or heating modes of operation by reversing a refrigeration vapor compression system by means of reversing valves and having an internal combustion engine prime mover to drive the compressor, and which produces excess heat for rejection, in combination:

(a) first heat exchanger means in heat exchange relation with an ambient atmosphere and functioning as a refrigerant vapor condenser in the system cooling mode of operation and as a refrigerant evaporator in the system heating mode of operation;

(b) a second heat exchanger means receiving engine prime mover reject heat and transferring said reject heat to a working fluid;

(c) a third heat exchanger receiving flow of said working fluid and in heat exchange relation with said ambient atmosphere as a radiator of said rejected heat in the cooling mode; and

(d) a working fluid distribution means selectively operable to flow said heated working fluid in heat transfer relation through said first heat exchanger means;

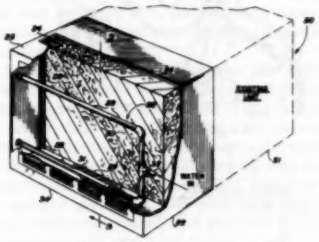
said fluid distribution means flowing said heated working fluid in heat transfer relation to said first heat exchanger means, when the heat pump system is selectively operating in the heating mode of operation and discontinuing said flowing of working fluid to said third exchanger in the heating mode of operation.

5,003,789

MIST AIR CONDITIONER FOR EVAPORATIVE COOLER

Manuel Gaona, 6509 S. 28th St., and Stephen M. Gaona, 6509 S. 28th St., both of Phoenix, Ariz. 85040

Filed Mar. 1, 1990, Ser. No. 487,154
Int. Cl.[5] F28D 5/00
U.S. Cl. 62—304 13 Claims



1. A precooler for air flowing through an ambient air inlet of an associated evaporative cooler comprising:

an evaporative cooler pad formed of a fibrous material,

a manifold mounted adjacent to and parallel with an air inlet side of said pad,

said manifold being connected to a source of water under pressure,

at least one nozzle means in said manifold positioned for directing a spray of water in the form of a mist across the inlet side of said pad,

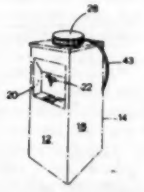
whereby the spray of water across said inlet side of said pad precools the air entering into the inlet of an evaporative cooler when said precooler is juxta-positioned thereto.

5,003,790

ADAPTOR TO CONVERT A BOTTLE FED WATER COOLER INTO A DEVICE SUPPLIED WITH PRESSURIZED WATER FROM THE LOCAL PIPING SYSTEM

Robert Goupil, 706 Boulevard Pie XII, Ste-Foy, Quebec, G1X 3S2, Canada

Filed Aug. 16, 1989, Ser. No. 394,485
Int. Cl.[5] B67D 5/62
U.S. Cl. 62—389 10 Claims



1. An adaptor for converting a water cooler supplied with water from a bottle having a neck, into a water cooler supplied with pressurized water from a local piping system, said cooler supplied with water from a bottle being of the commercially available type including an annular seat defining an opening for receiving the neck of the bottle placed in inverted position on said seat, and a cooled reservoir having an upper, open end through which the neck of the bottle extends to supply water into said reservoir, said adaptor comprising:

an annular body;

means for mounting said body on the annular seat of the cooler; and

valve means mounted on the annular body and connected to the local piping system for supplying water into the cooled reservoir, said valve means comprising means for controlling a supply of water into and a level of water in said reservoir, whereby sealing of the cooled reservoir for converting the cooler from a bottle supply mode of operation to a piping system supply mode of operation, is unnecessary.

5,003,791

PRINCIPLES AND APPLIANCES FOR THE CUTTING OF SPHERICAL-FACETED GEMS AND GEMS THUS OBTAINED

Giovanni Colliva, Rua Tenente Azevedo, 104 - São Paulo, Brazil

Division of Ser. No. 829,460, Feb. 12, 1986, Pat. No. 4,686,795, which is a continuation of Ser. No. 527,091, Aug. 29, 1983, abandoned. This application Jun. 9, 1987, Ser. No. 60,015
Claims priority, application Italy, Sep. 16, 1982, 41011 A/82; Aug. 3, 1983, 22408 A/83
Int. Cl.[5] A44C 17/00
U.S. Cl. 63—32 2 Claims

1. A gemstone having a gridle and a single table facet, a plurality of break facets between the table and the girdle and a plurality of pavilion facets on the side of the girdle opposite the table, the pavilion facets converging toward a culet, all of said pavilion facets being spherically concave.

5,003,792

SHAPED SECTION FOR THE GUIDANCE AND SEALING OF A MOVABLE WINDOW, IN PARTICULAR OF A MOTOR VEHICLE DOOR, AND ITS METHOD OF MANUFACTURE

Francois Mesnel, 6bis, rue Saligmac Fenelon, 92200 Neuilly S/Seine, and Gerard Mesnel, 16, rue Victor Hugo, 78420 Carrieres S/Seine, both of France

Filed Nov. 8, 1989, Ser. No. 433,002
Claims priority, application France, Nov. 8, 1988, 88 14566
Int. Cl.[5] E06B 7/16
U.S. Cl. 49—479 6 Claims

1. A shaped section for guiding and sealing a movable window, comprising:

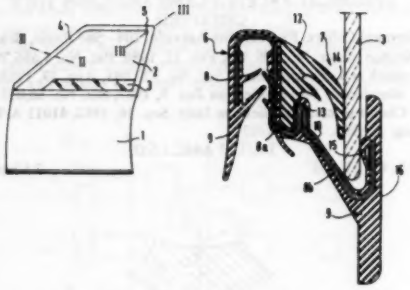
clamping means for fastening said shaped section to a shaped portion of a frame of the movable window;

a substantially U-shaped section adapted to receive the movable window, said U-shaped section being adjacent said clamping means;

a base of said U-shaped section including a resilient flexible hinge, said base having a main substantially linear part and a corner portion; and

said corner portion of the base adjacent said flexible hinge

and one the side of said flexible hinge furthest from said clamping means being elongated relative to the main substantially linear part of said base to follow the shape of at least one corner of said frame.



5,003,793

CARD WHEEL FOR A KNITTING MACHINE FOR MAKING KNIT GOODS WITH COMBED-IN FIBERS

Eberhard Leins, Filderstadt, and Klaus Kunde, Kohlberg, both of Fed. Rep. of Germany, assignors to Terrot Strickmaschinen GmbH, Stuttgart, Fed. Rep. of Germany

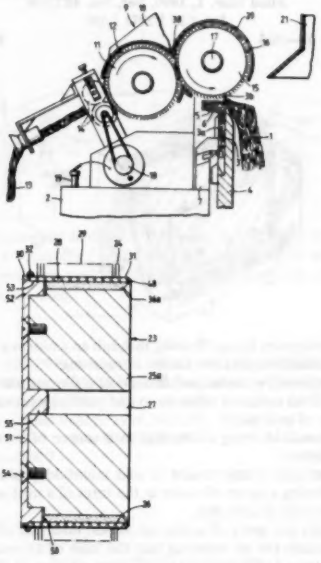
Filed Oct. 4, 1988, Ser. No. 253,073

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1987, 3733594; Jan. 15, 1988, 3801031

Int. Cl.[5] D04B *9/14*

U.S. Cl. 66—9 B **13 Claims**

1. Card wheel for a knitting machine for producing knit goods with combed-in fibers, comprising: a wheel body with a cylindrical circumferential surface; a flexible card clothing placed on said surface, said clothing consisting of a cloth band and of hooks incorporated into the band, and having on at least one lateral end a holding section free of hooks and running around the entire circumferential surface; and a clamping means surrounding said wheel body and said holding section, said clamping means being placed onto and clamping the holding section with a pressure against the circumferential surface sufficient to prevent only by means of said pressure, slippage of the cloth band and distortions thereof on said surface during operation of the card wheel.



5,003,794

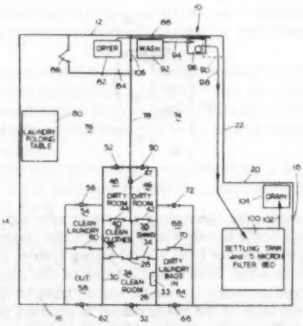
METHOD AND MEANS FOR LAUNDERING CONTAMINATED CLOTHING

Steven C. Griffis, 2929 Avenue D, Council Bluffs, Iowa 51501

Filed Mar. 6, 1990, Ser. No. 489,221

Int. Cl.[5] B08B *15/00*; D06F *35/00*

U.S. Cl. 68—3 R **1 Claim**



1. A contaminated clothing laundering facility, comprising,

an enclosure defining a washer side and a dryer side,

said washer side and said dryer side further defining a wash room and a dry room respectively,

a clean room in communication with said washer side and said dryer side and having a first selectively vented exit door which communicates with the area outside of said

enclosure, said clean room also having spaced apart second and third flap doors for permitting air to flow outwardly from said clean room,

a shower room on said washer side in communication with said clean room via said first flap door and having a flap door provided therein which permits air to flow outwardly from said shower room,

a first dirty room on said washer side and having a first selectively vented door in communication with said wash room, and a second selectively vented door in communication with said dryer side, said first dirty room being in communication with said shower room via said flap door in said shower room,

a dirty laundry bags room in said washer side and having a first selectively vented exit door provided therein which communicates with the area outside of said enclosure, said dirty laundry bags room also having a flap door provided therein for permitting air to flow outwardly therefrom,

a dirty laundry room adjacent said dirty laundry bags room in communication therewith via said flap door of said dirty laundry bags room, said dirty laundry room also having a selectively vented door provided therein which communicates with said wash room,

a clothes washer in said wash room,

a dirty water disposal means associated with said washer,

an air filtering machine in said wash room for creating a negative pressure within said wash side so that air will be drawn into said wash side through said vented exit doors of said clean room and said dirty laundry bags room,

a clean clothes room on said dryer side in communication with said clean room via said second flap door in said clean clothes room, said clean clothes room having a first flap door provided therein for permitting the flow of air outwardly therefrom,

a second dirty room adjacent said clean clothes room and being in communication therewith via said second flap door of said clean clothes room, said dirty room also being in communication with said first dirty room on said washer side via said second vented door in said first dirty room on said washer side, said second dirty room having a selectively vented door provided therein which communicates with said dry room,

an out room in said dryer side and having a selectively vented exit door provided therein which communicates with the area outside of said enclosure, said out room also having a flap door provided therein for permitting the flow of air outwardly therethrough,

a clean laundry room adjacent said out room and being in communication therewith via said flap door of said out room, said clean laundry room also having a selectively vented door formed therein which communicates with said dry room,

a clothes dryer in said dry area,

a pass-through opening between said dry room and said wash room whereby washed laundry may be passed from said wash room into said dry room for drying, said pass-through opening also providing a means by which air will flow from said dry room into said wash room thereby preventing the airborne movement of contaminants from said wash room into said dry room.

5,003,795

LOCK PROTECTOR

A. Chyril Hoke, 207 E. Main, P.O. Box 212, Bainbridge, Ind. 46105

Filed Sep. 1, 1989, Ser. No. 402,493
Int. Cl.[5] E05B *67/38*
U.S. Cl. 70—55 **18 Claims**

1. A lock protector for protecting a lock having a shackle attached to a hasp comprising:

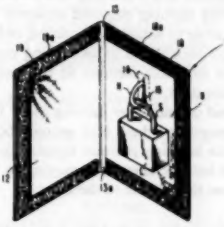
a first sheet portion having a first inner edge and a first perimeter;

a second sheet portion having a second inner edge and a second perimeter;

a hinge portion connecting the first and second sheet portions at said first and second inner edges;

said first sheet portion defining a slot, said slot being sized to receive the hasp therethrough in close fit relation; and

means for releasably sealing said first sheet portion to said second sheet portion substantially along the entire length



of said first and second perimeters when said first and second perimeters overlap;

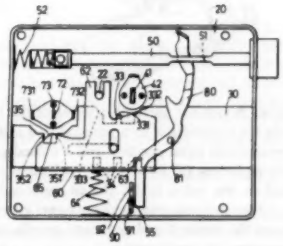
wherein said second sheet portion is adapted to fold over onto said first sheet portion along said hinge portion to overlap said first and second perimeters and to define an envelope therebetween to substantially completely enclose the lock and its shackle when the shackle is attached to the hasp and when the hasp is inserted through said slot.

5,003,796

MULTI-BOLT DOOR LOCK

Wilson Tom, No. 229, Pei-Tou Rd., Tsao-Tun Chen, Nan-Tu Hsien, Taiwan

Filed Aug. 1, 1989, Ser. No. 388,620
Int. Cl.[5] E05B *59/00*
U.S. Cl. 70—107 **7 Claims**



1. A door lock comprising:

a housing;

a first bolt member mounted movably to said housing and biased to a latching position;

means for operating said first bolt member externally;

an elongated second bolt member lying in said housing and mounted movably below said first bolt member, said second bolt member having a forward latching end, an opposite rear end and a longitudinal upper end with a first notched face near said forward latching end;

a pair of first actuating plates provided adjacent said first notched face and turnable about a horizontal axis to push said notched face so that said second bolt member is moved to a latching position or an unlatching position;

a locking plate cooperatively associated with said second bolt member and biased to move upward to a position in which said locking plate locks said second bolt member against movement, said locking plate releasing said second bolt when member depressed downward;

said second bolt member further including a second notched face in said upper end near said rear end of said second bolt member;

a second actuating plate provided adjacent to said second notched face to push said second notched face so as to move said second bolt member;

a lever pivoted to said second bolt member and having a first end extending upward to engage with said first bolt member and a second end extending downward; and

a third actuating member disposed adjacent to said second end of said lever to actuate said second end so as to move said first bolt member to its unlatching position, thereby enabling the first bolt member to be operated from the outside of the door;

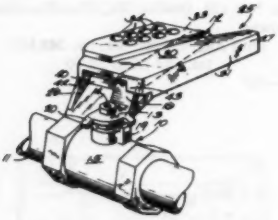
said second end of said lever moving away from said third actuating member when said second bolt member is moved to the latching position thereof, thereby preventing the first bolt member from moving to the unlatching position from the outside of the door.

5,003,797

LOCKOUT DEVICE FOR VALVES WITH LEVER HANDLES

Gary J. Wirth, Milwaukee, and George F. Jambor, Cedarburg, both of Wis., assignors to W. H. Brady Co., Milwaukee, Wis.

Filed Jul. 25, 1990, Ser. No. 557,872
Int. Cl.[5] F16K *35/10*
U.S. Cl. 70—180 **3 Claims**



1. A lockout device for use with a valve of the type having a valve body for connection to a pipeline and a lever handle rotatable between an open position and a closed position, the lever handle including (a) an inboard horizontal panel pivotally attached to the valve body, (b) an outboard horizontal panel, and (c) an inclined intermediate panel extending at an angle between the inboard and outboard panels, said lockout device comprising, in combination:

(1) a leg member having upper and lower portions, with a bearing surface along the lower portion of the leg member adapted to bear against the valve body or a pipeline connected to the valve body;

(2) a channel member extending from the upper portion of the leg member at an angle to the bearing surface and including spaced top and bottom walls and at least one side wall defining a channel including an entrance for receiving the inclined intermediate panel of a lever valve handle;

(3) pivot block means at a corner of the entrance to the channel and about which the lockout device is rotatable relative to a lever valve handle extending through the channel; and

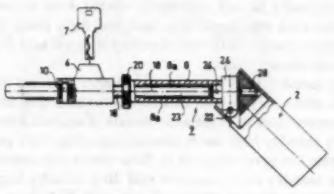
(4) aperture means extending through the top wall and bottom wall of the channel member for receiving a hasp of a lock in engagement with an edge of a lever valve handle extending through the channel.

5,003,798

VEHICLE LOCKING DEVICE

Anatoly Kofman, 8 Tamar Street, Neve Monoson, and Avraham Kavitsky, 78 Jabotinsky Street, Ramat Gan, both of Israel

Filed Feb. 14, 1990, Ser. No. 479,896
Claims priority, application Israel, Feb. 17, 1989, 89318
Int. Cl.[5] E05B *65/12*
U.S. Cl. 70—238 **6 Claims**



1. A vehicle locking device, comprising:

a sleeve for removably enclosing one control member of the vehicle;

a pair of locking members relatively movable with respect to each other to a closed position around a second control member of the vehicle, or to an open position to permit removal thereof from said second control member;

a lock for locking said locking members in their closed positions;

and a connecting assembly between said sleeve and pair of locking members preventing the sleeve from being removed from the first control member, and the locking members from being removed from the second control member, when the locking members are locked in their closed positions around said second control member;

said connecting assembly including:

a block carried at the end thereof adjacent said sleeve to which one end of the sleeve is pivotally mounted about a pivot point laterally spaced from the longitudinal axis of the connecting assembly;

and a pin threadedly received within said end of the sleeve and engageable with said block for fixing the pivot angle of the sleeve with respect to said connecting assembly to permit the locking device to be preset to fit different vehicles.

5,003,799

DEVICE FOR LOCKING SHIFT LEVER OF AUTOMATIC TRANSMISSION

Hajime Imai; Shozo Kito, both of Nagoya; Shoichi Harada, Gifu; Yoshinobu Yokoyama, Inuyama; Syuzi Nakamura, Toyota; Shigetoshi Miyoshi, Toyota, and Tadao Muramatsu, Toyota, all of Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho and Toyota Jidosha Kabushiki Kaisha, both of, Japan

Filed Sep. 13, 1988, Ser. No. 243,759
Claims priority, application Japan, Sep. 14, 1987, 62-140648; Sep. 14, 1987, 62-140649; Oct. 1, 1987, 62-150888
Int. Cl.[5] E05B *65/12*
U.S. Cl. 70—247 **20 Claims**

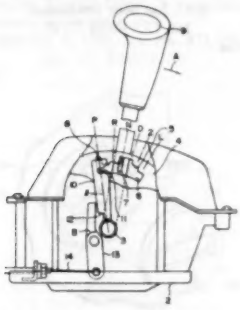
1. A shift lever locking device for locking an automatic transmission lever which is capable of being selectively moved to and set in one of a plurality of shift positions including at least one non-driving position, said device comprising:

a detect pin provided on said shift lever and designed to be moved in one direction in response to pressing of a button provided on said lever;

a detent plate capable of selectively latching said shift lever in cooperation with said detent pin and having a locking recess capable of receiving said detent pin when said detent pin is moved in the other direction after said shift lever is set in said non-driving position;

a movable member, independent of said shift lever and said

detent pin and capable of engagement with said detent pin at least when said detent pin is being brought into engagement with said locking recess and movable between a lock position where it engages with said detent pin so as to prevent said detent pin from moving and an unlock position where it is disengageable from said detent pin to allow said detent pin to move; and



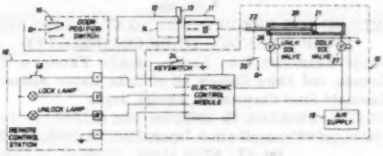
a lock member independent of said shift lever and said detent pin and movable between a first position where it prevents said movable member from moving from said lock position and a second position where it allows said movable member to move from said lock position to said unlock position and capable of being moved from said second position to said first position when a predetermined condition is met while said shift lever has been set in said non-driving position.

5,003,800

DOOR LOCK CONTROL SYSTEM FEATURING A REMOTE CONTROL FOR A PNEUMATICALLY POWERED DOOR LOCK MECHANISM

Leszek Bublewicz, San Antonio, Tex., assignor to Phelps-Tointon, Inc., Greeley, Colo.

Filed Jul. 17, 1989, Ser. No. 380,865
Int. Cl.[5] E05B *53/00*
U.S. Cl. 70—264 **6 Claims**



1. A control system for remotely controlling a bolt in a door locking system from the unlock, slamlock, and deadlock positions while still allowing local operation of said bolt, the control system comprising:

(a) a door and a door frame adapted for closing or opening by rotating on a hinge supporting said door;

(b) remote control means connected to said bolt for controlling operation of said bolt at a remote location relative to said door locking system, said bolt being controlled between said unlock, slamlock, and deadlock positions;

(c) local control means connected to said bolt for controlling operation of said bolt at a local location relative to said door and door frame, said bolt being movable in said door locking system;

(d) door position switch means connected to said door for determining movement of said door with respect to said door frame, said door position switch means generating a door closed signal when said door is closed and feeding said door closed signal to said remote control means;

(e) bolt position means adjacent to said bolt for determining movement of said bolt into said deadlock position and generating a bolt position signal responsive thereto;

(f) powered means connected to said bolt and operated by said remote control means for retracting and extending said bolt, said powered means having

(i) said deadlock position of said bolt,

(ii) said slamlock position of said bolt, and

(iii) said unlock position of said bolt; and

(g) said powered means further comprising

(i) a double acting pneumatically powered piston rod in a cylinder,

(ii) a first solenoid valve delivering air to a first side of said piston rod, and

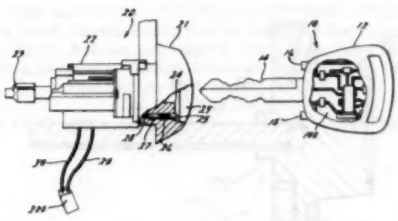
(iii) a second solenoid valve delivering air to a second side of said piston rod.

5,003,801

PROGRAMMABLE KEY AND IMPROVED LOCK ASSEMBLY

Robert P. Stinar, Plymouth; George T. Calvas, Dearborn, and David A. McNamara, Saline, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 20, 1987, Ser. No. 5,070
Int. Cl.[5] E05B *47/00*
U.S. Cl. 70—278 **8 Claims**



1. An improved key for use in a security system which utilizes a tumbler movable lock which is unlocked by the insertions of a key shank cut to correspond to the unlocked tumbler configuration and contains at least one electrical lock terminal for making electrical contact with said key and for supplying electrical power to said key, wherein the improved key comprises:

a handle portion connected to said shank and sized for manual gripping of the key;

at least one electrical key terminal extending from said handle portion adjacent to and electrically isolated from said shank for making electrical contact with said electrical lock terminal;

means within said handle portion and connected to said at least one electrical key terminal for receiving said electrical power from said lock and providing a predetermined digital code signal to said electrical key terminal.

5,003,802

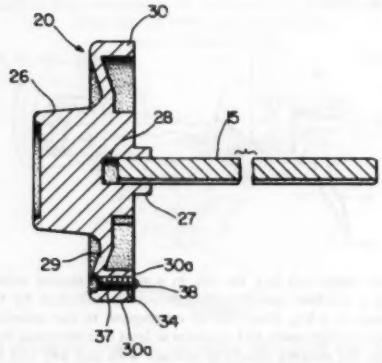
DIAL AND DIAL RING ASSEMBLY WITH DETENTING FEATURE

Scott M. Beatty, Nicholasville, and John R. Bishop, Lexington, both of Ky., assignors to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Filed Nov. 30, 1989, Ser. No. 443,240
Int. Cl.[5] E05B *63/00*
U.S. Cl. 70—333 A **3 Claims**

1. A combination lock dial ring and rotatable dial assembly for combination locks and the like designed to provide limited range top reading of the dial indicia and graduations, compris-

ing a rotatable dial member having a circular dial formation and a knob formation integral therewith projecting centrally forwardly therefrom, the dial formation including an annular disc portion integrally joined to and extending radially outwardly from the radially outermost part of the knob formation, a peripheral flange formation integrally joining said disc portion at its outermost region integrally joining said disc portion at its outermost region having a cylindrical radially outwardly facing surface concentric with a center axis of the dial member, said outwardly facing surface carrying dial graduation marks and numeral indicia for a selected number of different angular dialing positions of the dial member, a dial ring member including a generally circular base wall portion having a fixed index mark and having near its outermost edge a forwardly projecting, generally cylindrical annular shield portion defining a forwardly opening cylindrical well to receive said dial formation nested therein, the shield portion having a circumferential interruption defining an opening for limited range view of the dial graduation marks, the base wall portion immediately radially inwardly of the cylindrical shield portion having an annular detenting land formation defining a ring-like forwardly facing detenting surface having circumferentially spaced detenting recesses in the forma of shallow radially elongated



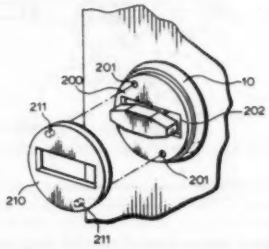
slot-like detenting cavities equalling in numbers said selected number of dialing positions, and said peripheral flange portion of said dial member having an axially elongated, rearwardly opening plunger-receiving bore having a center axis parallelling the axis of rotation of the dial member and housing a resiliently biased detenting plunger means, including a movable plunger having a protruding contact surface resiliently urged into said slot-like detenting recesses of said annular detenting land formation to resiliently urge the dial member to angular positions locating said graduation marks thereon in precise alignment with the fixed index mark on said dial ring, said plunger means including an elongated tubular casing threaded in said plunger-receiving bore for axial adjustment along the plunger-receiving bore upon rotation of said casing, the casing having said plunger supported therein for relative movement axially thereof and enclosing a coil spring captured therein bearing against said plunger, said plunger-receiving bore being a tapped opening, and said casing having a threaded exterior intercoupled with the threaded surface of said tapped opening and a forward end of the casing located within said plunger-receiving core and having a diametrical slot to receive a bit of a tool for rotating the casing for adjustment of the resilient detenting interacting forces between the plunger contact surface and the walls of the detenting cavities.

5,003,803

BLOCKING DEVICE FOR LATCH MECHANISM

Robert M. Richards, 3223 Etude Drive, Malton, Ontario, Canada L4T 1S9, assignor to Robert M. Richards, Malton, Canada

Continuation-in-part of Ser. No. 152,231, Feb. 4, 1988, Pat. No. 4,869,086. This application Aug. 2, 1989, Ser. No. 388,405
Claims priority, application Canada, Oct. 19, 1987, 549662
The portion of the term of this patent subsequent to Sep. 26, 2007, has been disclaimed.
Int. Cl.[5] E05B *13/00*
U.S. Cl. 70—416 **15 Claims**



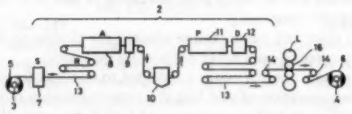
1. A repositionable latch blocking means for use with latchable means, the latchable means having operating means to operate the latchable means between locked and unlocked positions, the latch blocking means comprising at least a first surface, the latch blocking means having fastening means disposed thereupon to fasten the latch blocking means proximate the operating means of the latchable means, so as to position the at least first surface to block the operation of the operating means and thereby prevent the operation of the latchable means between locked and unlocked positions, whereby when the latch blocking means is repositioned, so as to position the at least first surface remote the operating means said repositioning allowing the operation of the latchable means, wherein the fastening means further comprises detent portions on the latch blocking means which engage detent portions on an intermediate member affixed to the latchable means, the detent portions for prevention of the movement of the latch blocking means in use.

5,003,804

METHOD FOR PRE-PROCESSING STAINLESS STEEL STRIP INTENDED TO BE COLD-ROLLED

Kazuhito Kenmochi; Ikuo Yarita; Akihiko Fukuhara; Tomio Komatu, and Akira Kishida, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Dec. 19, 1989, Ser. No. 452,967
Claims priority, application Japan, Dec. 23, 1988, 63-323705
Int. Cl.[5] B21B *45/04, 27/10*
U.S. Cl. 72—39 **4 Claims**



1. A method of pre-processing a hot rolled stainless steel strip intended to be cold-processed, comprising the steps of:

annealing and pickling the stainless steel strip after completing hot rolling;

conducting the strip between the surfaces of strip processing rolls;

applying to the surfaces of said rolls a liquid lubricant having a viscosity of 1–15 cst and having a thickness of 1 μm or

less before said rolls come into contact with said stainless steel strip; and

cold rolling said stainless steel strip in the presence of said lubricant at a reduction ration of 5-20%.

5,003,805

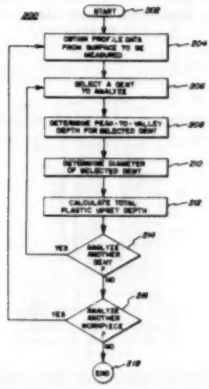
METHOD AND SYSTEM FOR MONITORING SHOT PEENING

Robert A. Thompson, Quaker Street, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 2, 1990, Ser. No. 473,781

Int. Cl.[5] B24C *1/10*

U.S. Cl. 72—53 **18 Claims**



1. A method for monitoring a peening operation, a system user having predetermined a desired total plastic upset depth for dents in the surface to be peened, said method comprising the steps of:

(a) obtaining profile data of a workpiece surface which has been peened, said profile data being obtained in a nondestructive and direct manner;

(b) selecting a dent to analyze;

(c) calculating an actual total plastic upset depth for the selected dent; and

(d) adjusting, if needed, the peening operation so that the actual total plastic upset depth of a subsequently formed dent will be more in conformance with the predetermined desired total plastic upset depth.

5,003,806

APPARATUS FOR PRODUCING CURVILINEAR TUBES

Isao Nemoto, 11-24, Higashinarashino 6-chome, Narashino-shi, Chiba-ken, Japan

Filed Oct. 23, 1989, Ser. No. 425,120

Claims priority, application Japan, May 29, 1987, 62-82923[U]

Int. Cl.[5] B21C *25/08*

U.S. Cl. 72—260 **11 Claims**

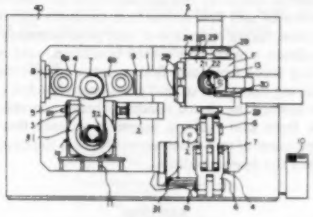
1. An apparatus for producing curvilinear tubes, the apparatus comprising:

(a) a die having an axially symmetric inner surface for passing tube material therethrough;

(b) a core member having an axially symmetrical outer surface and disposed in the die in a spaced relation to the inner surface of the die so that tube producing material passes between a gap defined by the inner surface of the die and the outer surface of the core member; and

(c) positioning means for positioning the die in offset relation to the core member in a plane perpendicular to an axis of the core member wherein the positioning means comprises motor means for displacing the die relative to the core member, and transformation means for transforming a rotational movement of an output shaft of said motor means to a linear movement of the die,

said transformation means including a speed reducing transmission mechanism connected to the output shaft, said transmission mechanism including a worm and a worm



wheel, said worm having a generally cylindrical form tapered from both ends thereof to a central portion thereof, said worm wheel having a plurality of teeth, each of the teeth comprising a disk rotatably supported on said worm wheel and biased toward the worm by resilient means so as to eliminate backlash between said worm and said worm wheel.

5,003,807

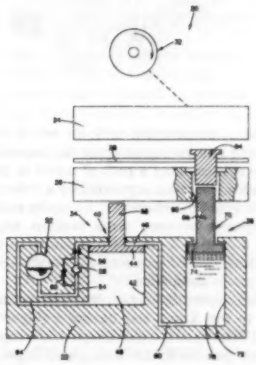
PRESS ASSEMBLY AND METHOD OF OPERATION

John Terrell, Moreland Hills; Paul M. Kadis, Chardon; Leonard L. Hiney, Ravenna, and Susan E. Pfaff, Seven Hills, all of Ohio, assignors to Teledyne Industries, Inc., Cleveland, Ohio

Filed Oct. 30, 1989, Ser. No. 429,200

Int. Cl.[5] B21D *24/08*

U.S. Cl. 72—351 **193 Claims**



1. A press assembly operable from an open condition to a closed condition to deform a workpiece, said press assembly comprising a first movable member for engaging a first side of the workpiece, a second movable member for engaging a second side of the workpiece, said first member being movable in a first direction toward said second member during operation of said press assembly from an open condition toward a closed condition, said first and second members being movable together in the first direction with at least a portion of the workpiece disposed between said first and second members during operation of said press assembly from the open condition toward the closed condition, a cushion assembly operable toward a retracted condition to provide a yieldable force opposing movement of said second member in the first direc-

tion during operation of said press assembly from the open condition toward the closed condition, and control means for initiating movement of said second member in the first direction prior to movement of said first and second members together in the first direction during operation of said press assembly from the open condition toward the closed condition, said control means including means for transmitting force from said first member to said cushion assembly to initiate operation of said cushion assembly toward the retracted condition prior to movement of said first and second members together in the first direction during operation of said press assembly from the open condition toward the closed condition, said means for transmitting force from said first member to said cushion assembly during operation of said press assembly from the open condition toward the closed condition being operable to transmit force from said cushion assembly to said first member during operation of said press assembly from the closed condition toward the open condition.

5,003,808

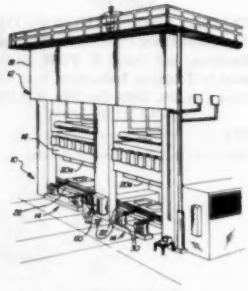
SYSTEM FOR TRANSFERRING WORKPIECES THROUGH A SERIES OF WORK STATIONS

John H. Maher, 6742 River Rd., Flushing, Mich. 48433

Continuation-in-part of Ser. No. 210,368, Jun. 23, 1988, Pat. No. 4,887,446. This application Jun. 15, 1989, Ser. No. 365,201

Int. Cl.[5] B21J *13/08*

U.S. Cl. 72—405 **17 Claims**



12. For use in conjunction with an article forming press which includes a ram having an upper die associated therewith adapted to be driven along a path of travel in the Z-axis and engagable with a lower die supported by a bolster for forming a workpiece inserted therebetween, a transfer system for transferring workpieces between work stations aligned linearly along and at a central X-axis perpendicular to the Z-axis, to perform a predetermined sequence of operations on the workpieces, said system comprising:

a transfer rail extending longitudinally in spaced and parallel relation to the X-axis and having a finger operator rail mounted thereupon for movement with respect thereto in a direction parallel to the X-axis, said finger operator rail being mounted entirely between said transfer rail and said central X-axis;

a plurality of workpiece gripping finger operators mounted on the finger operator rail at equally spaced locations thereon corresponding to the spacing of the workstations, said finger operators extending laterally inboard from the transfer rail in a Y-axis, perpendicular to and toward the central X-axis and Z- axis and each terminating in a free end having a workpiece engaging section adapted to engage the workpieces and to transfer them between adjacent work stations;

at least one actuator unit supported independently from the transfer rail and disposed in a location displaced laterally along the Y-axis from the article forming press, said actuator unit having a transfer carriage which extends therefrom in the Y-direction and which is operative to move the transfer rail along both the Y and Z axes;

driven means for said finger operator rail supported independently of and associated to move with said transfer rail; wherein,

said driven means and said actuator unit are powered by motor means which are means stationary with respect to the movement of said finger operator and transfer rails.

5,003,809

METHOD OF MOUNTING AND DEMOUNTING MOLDS TO AND FROM PRESS MOLDING MACHINE

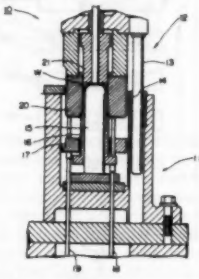
Masayuki Oyama, Kiryu, Japan, assignor to Mitsuba Electric Mfg. Co., Ltd., Kiryu, Japan

Filed Apr. 30, 1990, Ser. No. 516,437

Claims priority, application Japan, May 2, 1989, 1-113261

Int. Cl.[5] B21D *37/04*

U.S. Cl. 72—446 **9 Claims**



1. A method of mounting and demounting at least two, upper and lower dies to and from a press molding machine, said method comprising the steps of:

inserting a workpiece into a press position between said upper and lower dies;

pressing or stamping said workpiece at said press position by said upper and lower dies;

maintaining said upper and lower dies at said press position to leave the workpiece after having been pressed or stamped, at said press position between said upper and lower dies; and

mounting and demounting said upper and lower dies to and from said press molding machine, with said workpiece maintained at said press position between said upper and lower dies.

5,003,810

FLUID METER

Peter Jepson, Whitley Bay, and Graham M. Tofield, Northwich, both of England, assignors to Thorn Emi Flow Measurement Limited, Stretford, England

Filed Aug. 26, 1988, Ser. No. 237,389

Claims priority, application United Kingdom, Aug. 28, 1987, 8720356

Int. Cl.[5] G01F *25/00, 7/00*

U.S. Cl. 73—3 **8 Claims**

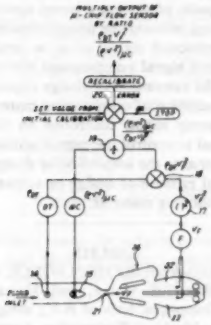
1. A fluid flow meter for use in domestic gas metering, the meter comprising:

solid state flow sensing means for providing an output signal indicative of the flow rate of said fluid;

a fluidic flowmeter for providing a digital output signal indicative of the velocity of said fluid at flow rates above a predetermined level;

calibration means operative at flow rates above said predetermined level for periodically comparing respective output signals of the solid state flow sensing means and the fluidic flowmeter and for producing and storing an error

signal dependent upon the difference between said output signals; and



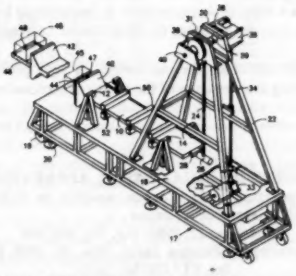
means for correcting the output signal of the solid state flow sensing means in dependence upon the error signal stored.

5,003,811

SHOCK TESTING APPARATUS

Leland K. Shannon, San Diego; Ted L. Gentry, and Toby Le, both of Poway, all of Calif., assignors to Cubic Defense Systems, San Diego, Calif.

Filed Apr. 28, 1989, Ser. No. 345,098
Int. Cl.[5] G01N *3/30*
U.S. Cl. 73—12 **27 Claims**



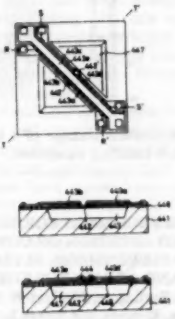
22. A shock testing apparatus, comprising:
an elongated beam;
suspension means for suspending the beam for movement in a longitudinal direction;
impact means for impacting a first end of the beam, the impact means comprising a pendulum; mounting means at the opposite end of the beam for mounting a component to be tested;
sensing means for the oscillation of the beam as a result of impact;
drive means for driving the pendulum to a predetermined height; and
control means for releasing the pendulum when the predetermined height is reached.

5,003,812

GAS DETECTING DEVICE

Shinji Yagawara, Yokohama; Junji Manaka, Kawasaki, and Wasaburo Obta, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 288,279, Dec. 22, 1988, Pat. No. 4,967,589.
This application Jul. 30, 1990, Ser. No. 559,148
Claims priority, application Japan, Dec. 23, 1987, 62-325921; Mar. 1, 1988, 63-48408; Mar. 25, 1988, 63-71061; May 10, 1988, 63-114372; May 24, 1988, 63-126836; May 24, 1988, 63-126837; Jul. 6, 1988, 63-169534; Dec. 6, 1988, 63-306850
Int. Cl.[5] G01N *27/12*
U.S. Cl. 73—31.06 **2 Claims**



1. A gas detecting device comprising:
a substrate;
an insulator layer formed on said substrate;
a gas sensitive layer buried in said insulator layer;
a pair of detection leads formed on said insulator layer, said pair of detection leads partially overlying said gas sensitive layer, a signal derived from said gas sensitive layer being sent to an external circuit through said pair of detection leads;
a heater member arranged on said insulator layer in the vicinity of said gas sensitive layer; and
an insulation coating layer formed on said pair of detection leads and said heater member, a portion of an upper surface of said gas sensitive layer being exposed to gas through the pair of the detection leads.

5,003,813

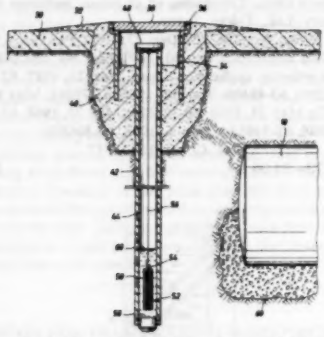
METHOD AND APPARATUS FOR MONITORING STORAGE TANK LEAKAGE

William V. Hayes, Bandera, Tex., assignor to Hayes Separations, Inc., Bandera, Tex.

Filed Feb. 20, 1990, Ser. No. 481,899
Int. Cl.[5] G01M *3/04*; G08B *23/00*
U.S. Cl. 73—49.2 **23 Claims**

1. A method for testing for hydrocarbon leakage near hydrocarbon handling equipment where the method comprises the steps of:
(a) forming a plurality of shallow holes in the near vicinity of hydrocarbon handling equipment to a depth sufficient for exposure to and patterned to intercept in the holes diffused subsurface hydrocarbon migration;
(b) positioning in the holes absorbent cartridges capable of selectively absorbing diffused hydrocarbon migration;
(c) periodically removing the cartridges from the wells and flowing a gas through the cartridges to desorb the hydrocarbons for measuring the absorbed hydrocarbons on the cartridges; and

(d) comparing the measured hydrocarbons on the cartridges with a specified threshold hydrocarbon measurement to



determine hydrocarbon leakage of a specified size from the hydrocarbon handling equipment.

5,003,814

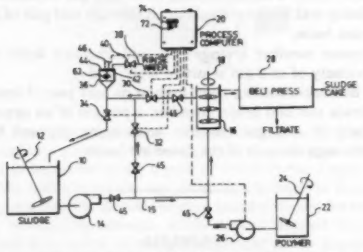
SAMPLING PROCESSES FOR USE IN THE CONTROLLED ADDITION OF CONDITIONING MATERIAL TO SUSPENSIONS, SLUDGES AND THE LIKE AND APPARATUS THEREOF

Paul M. Crawford, Burlington; Herbert W. Campbell, Dundas; Michael J. Myers, Kilbride, and Steven L. Siverns, Hamilton, all of Canada, assignors to Lenox Envionmental Inc., Ontario, Canada

Continuation-in-part of Ser. No. 187,801, Apr. 29, 1988, abandoned. This application May 1, 1989, Ser. No. 345,256

Int. Cl.[5] G01M *11/10*

U.S. Cl. 73—59 **26 Claims**



12. Apparatus for sampling suspensions or sludges and for control of the addition of dewatering conditioning material thereto to produce an optimized mixture, the apparatus comprising:

a sampling vessel;

a viscometer having a rotatable rotor protruding into the vessel interior to be immersed in a suspension or sludge therein and adapted to produce a signal representative of the rheology of the suspension or sludge;

pipe and valve means connected to the vessel for charging the vessel interior in a sequence with

(a) unconditioned suspension or sludge;

(b) the same suspension or sludge with added conditioning material; and

(c) water for rinsing the vessel interior;

valve control means connected to said valve means for operation thereof in the said sequence

viscometer operating means for operating the viscometer with the vessel filled with unconditioned and conditioned suspension or sludge to produce respective corresponding unconditioned and conditioned signals representative of the respective shear stress of the suspension or sludge, the unconditioned signal being representative of the solids content of the suspension or sludge;

signal utilizing means receiving the unconditioned and conditioned signals, producing a pump means control signal therefrom and utilizing the unconditioned signal to modify the conditioned signal so as to produce the pump means control signal compensated for change in solids content of the suspension or sludge requiring a change in the rate of addition of conditioning material; and

controllable pump means controlled by the pump means control signal to control the rate of addition of the conditioning material to the suspension or sludge so as to obtain an optimized mixture of sludge or suspension and dewatering conditioning material.

5,003,815

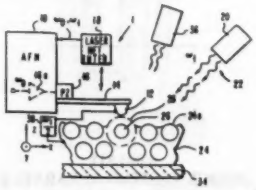
ATOMIC PHOTO-ABSORPTION FORCE MICROSCOPE

Yves Martin, Briarcliff Manor, and Hemantha K. Wickramasinghe, Chappaqua, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 20, 1989, Ser. No. 424,377

Int. Cl.[5] G01B *15/00, 11/30*

U.S. Cl. 73—105 **16 Claims**



1. Spectroscopic apparatus comprising:

means for illuminating a surface of a sample with radiation having a characteristic wavelength selected for being absorbed by atoms or molecules of interest such that the atoms or molecules of interest increase in radius;

means for translating a probe tip proximal to the surface of the sample, the probe tip being mounted such that it experiences a detectable movement in response to being positioned near to an atom or molecule of increased radius; and

means for detecting the movement of said probe tip for indicating the presence of the atoms or molecules of interest.

5,003,816

ENGINE IDLING CONTROL APPARATUS

Masaaki Furuyama, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1989, Ser. No. 441,260

Claims priority, application Japan, Nov. 30, 1988, 63-303412

Int. Cl.[5] G01M *15/00*

U.S. Cl. 73—117.3 **5 Claims**

1. An engine idling control apparatus comprising:

an idle switch responsive to an opening condition of a throttle valve;

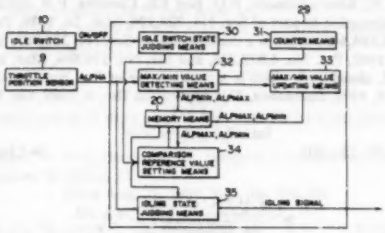
idle switch state judging means for judging the idling state responsive to output from said idle switch;

a throttle position sensor for detecting the opening degree of said throttle valve;

learning means for detecting maximum and minimum values of output from said throttle position sensor and for updating the maximum and minimum values, when said idle switch state judging means judges the idling state;

comparison reference value setting means for setting an idling judgement comparison reference value in accor-

dance with the maximum and minimum values updated by said max/min value learning means; and



idling state judging means for judging proper idling state by comparing said idling judgement comparison reference value with output the said throttle position sensor.

5,003,817

APPARATUS AND A METHOD FOR TESTING OF SYNCHRONIZING SYSTEMS

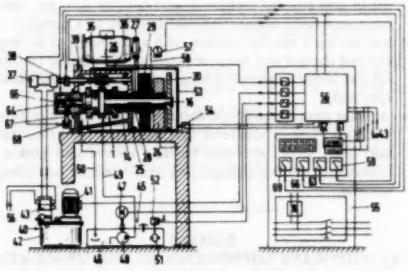
Hermann Pflaum, Maisach, and Richard Strehler, Chieming, both of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Filed Feb. 20, 1990, Ser. No. 482,307

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1989, 3905333

Int. Cl.[5] **G01M** *19/00*

U.S. Cl. 73—118.1 **11 Claims**



1. In an apparatus for the testing of synchronizing systems designated for use in gear-shift mechanisms in vehicle transmissions and for the purpose of determining factors influencing at least one of performance, design, materials , lubricants and temperature, said apparatus including:

(a) at least one of a first transmission gear and a first clutch ring having a clutch tooth system and a first synchronizing cone thereon, and a first synchronizing ring mounted on said first synchronizing cone;

(b) a second transmission gear arranged coaxially with respect to said at least one of said first transmission gear and said first clutch ring and having a clutch tooth system and a second synchronizing cone thereon, and a second synchronizing ring mounted on said second synchronizing cone, said first and second synchronizing cones being oriented on mutually opposing sides of said at least one of said first transmission gear and said first clutch ring and said second transmission gear;

(c) a gear-shift sleeve means coaxially arranged between said first and second synchronizing cones, and mounted on a shaft fixed against rotation, however, being axially movable, said gear-shift sleeve means operatively cooperating with a selected one of said first and second synchronizing rings and clutch tooth systems;

(d) a rotatable drive shaft;

(e) a rotary drive means for said drive shaft;

(f) a rotatable driven shaft having a first flywheel mass connected thereto and being rotatable therewith;

(g) means for effecting a back and forth movement of said gear-shift sleeve means into and out of coupling engagement with a selected one of said first and second synchronizing cones to cause an alternate coupling of said driven shaft to said drive shaft, to effect a driven rotation of said driven shaft, and said driven shaft to said fixed shaft, to effect a stoppage of the rotation of said driven shaft;

(h) and collecting and evaluating means for collecting and evaluating relevant data, the improvement wherein:

(i) a frame is provided;

(j) said at least one of said first transmission gear and said first clutch ring having said first synchronizing cone thereon being exchangeably arranged at one end of said drive shaft, said drive shaft being rotatably supported in said frame and having a second flywheel mass affixed to an opposite end thereof;

(k) at least one of said second transmission gear and a second clutch ring on said second transmission gear having said second synchronizing cone mounted thereon being supported fixed against rotation, however, exchangeably on a receiving means fixed to said frame, said at least one of said first transmission gear an d said first clutch ring and said second transmission gear and said second clutch ring being arranged and spaced from one another in accordance with their installed arrangement and spacing in the designated gear-shift mechanism; and

(l) said gear-shift sleeve means being exchangeably arranged on an end of said driven shaft which is remote from said first flywheel mass.

5,003,818

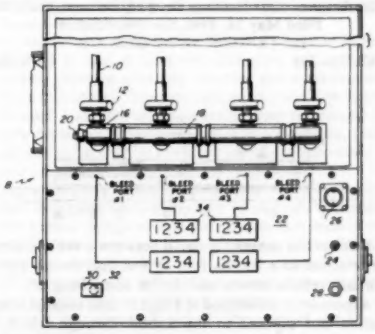
AIRCRAFT BRAKE TESTER

James W. Hoodenpyle, Fort Worth; James P. Robinson, Smithfield, and John W. Wright, Arlington, all of Tex., assignors to Howell Instruments, Inc., Fort Worth, Tex.

Filed Jan. 18, 1990, Ser. No. 466,950

Int. Cl.[5] **G01L** *5/28*

U.S. Cl. 73—121 **12 Claims**



1. An aircraft brake tester adapted to test hydraulic pressures in a plurality of aircraft brake lines corresponding to respective cylinders of an aircraft brake, comprising:

a plurality of pressure transducers connected to corresponding ones of the aircraft brake lines to output pressure signals corresponding to the hydraulic pressure in each of the plurality of aircraft brake lines;

processing means, connected to the plurality of pressure transducers, for selecting the pressure transducers, for memorizing the pressure signals output by the selected pressure transducers, and for calculating a difference

signal according to the pressure signals corresponding to the selected pressure transducers; and

means for indicating the memorized pressure signals and for indicating the difference signal.

5,003,819

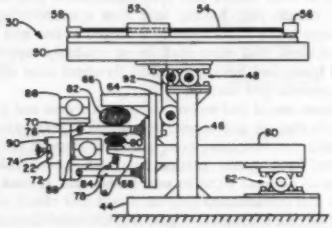
SUSPENSION SIMULATOR

Gary H. Koopmann, State College, Pa., assignor to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Jan. 2, 1990, Ser. No. 459,854

Int. Cl.[5] G01M *17/02*

U.S. Cl. 73—146 **19 Claims**



3. A suspension simulator for testing a wheel and tire assembly, comprising:

a spindle receiving a wheel and tire assembly;

a movable surface in contacting engagement with said tire for simulating a road surface;

suspension means connected to said spindle for replicating a suspension system of a vehicle, said suspension means comprising a pair of frame members pivotally interconnected between a pair of plates, a first one of said plates receiving said spindle; and

a load means connected to said suspension means for imparting a load upon said tire against said movable surface.

5,003,820

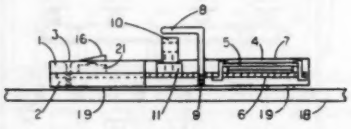
ELECTRONIC SPEEDOMETER FOR SNOW SKIS

Eric Dittbrenner, 2203 Hastings Dr. #23, Belmont, Calif. 94002

Filed May 24, 1990, Ser. No. 527,934

Int. Cl.[5] G01C *21/10*; G01F *1/68*

U.S. Cl. 73—181 **15 Claims**



1. A device for measuring speed between a vehicle adapted to be attached to a human foot or feet and the air through which said vehicle moves, said device comprising of:

(a) a thermistor maintained at a higher than ambient temperature and exposed to the airflow through which said vehicle moves;

(b) a thermocouple exposed to said airflow through which said vehicle moves;

(c) a base on which said thermistor and said thermocouple are mounted;

(d) means on said base for supplying electrical current to said thermistor and said thermocouple;

(e) means on said base for reading, combining and converting signals obtained from said thermistor and said thermocouple to a speed reading;

(f) and means for displaying said speed reading digitally.

5,003,821

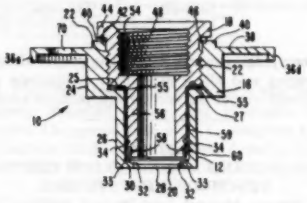
METER BOX OR METER YOKE EXPANSION MECHANISM

Jose M. Rivero-Olmedo, P.O. Box ER, Carolina, P.R. 00628

Continuation-in-part of Ser. No. 328,226, Mar. 24, 1989, Pat. No. 4,884,442, which is a continuation of Ser. No. 251,987, Sep. 29, 1988, Pat. No. 4,872,338, and Ser. No. 170,644, Mar. 16, 1988, abandoned, which is a continuation of Ser. No. 816,903, Jan. 8, 1990, abandoned. This application Dec. 4, 1989, Ser. No. 444,977

Int. Cl.[5] G01F *15/18*

U.S. Cl. 73—201 **24 Claims**



1. An expansion mechanism for connecting a meter within a meter box or yoke, comprising:

a hand wheel having a partially threaded axial opening therethrough with an annular rim extending inwardly into said axial opening, said annular rim having an annular surface;

a bushing having a threaded portion cooperating with said partially threaded axial opening in said hand wheel, a sleeve depending from said bushing for axial movement about said annular surface of said annular rim, and means for operatively connecting said bushing to a conduit;

a cup having a tubular surface with an opening at an opposite end thereof and being secured to said annular rim, said tubular surface extending longitudinally from said annular rim; and

an annular gasket positioned about said sleeve for movement with said sleeve whereby threaded movement between said hand wheel and said bushing moves said gasket in continuous sealing engagement axially along said tubular surface.

5,003,822

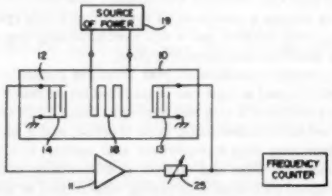
ACOUSTIC WAVE MICROSENSORS FOR MEASURING FLUID FLOW

Shrinivas G. Joshi, 4344 Regal Ct., New Berlin, Wis. 53151

Filed Oct. 2, 1989, Ser. No. 416,144

Int. Cl.[5] G01F *1/68*

U.S. Cl. 73—204.23 **18 Claims**



1. A surface acoustic wave device for measuring the flow rate of a gas or liquid, comprising:

a surface acoustic wave delay line including a substrate having disposed on one of its surfaces a transmitting input transducer and a receiving output transducer spaced from said input transducer to form a propagation path therebetween;

heater means for heating said substrate to a temperature

higher than ambient, said heater means disposed on said substrate in said propagation path and having a geometry so as to minimize absorption and reflection of an acoustic wave propagating in said path; and

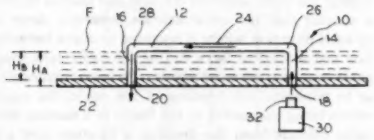
a source of power for said heater means disposed externally of said delay line.

5,003,823

NONCONTACT ROTATING LIQUID FILM THICKNESS SENSOR

Richard W. Rice, Belvidere, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 21, 1989, Ser. No. 396,240
Int. Cl.[5] G01F *23/26*; G01N *21/41*
U.S. Cl. 73—293 **8 Claims**



1. A noncontact liquid sensor for sensing a select discrete level of a liquid in a container travelling in a select path of movement comprising:

an elongated glass rod internal to and attached to said container, the rod being U-shaped and having opposite legs each having an end received in an opening through a wall of said container such that said ends have selected paths of movement, the legs having a length corresponding to the discrete level to be sensed, said rod having an index of refraction less than that of the liquid to be sensed;

a light source; and

means for supporting said light source outwardly of the container disposed proximate a point in the select path of movement of one end of said glass rod;

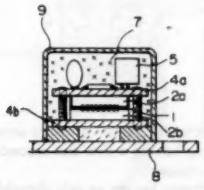
wherein light entering the one end of the glass rod when the one end thereof is proximate said light source exits the other end thereof only if the liquid level is less than the select level.

5,003,824

VIBRATION/ACCELERATION SENSOR

Tetsuji Fukada; Masayuki Wakamiya, both of Suita, and Kikuo Kainou, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 26, 1989, Ser. No. 456,372
Int. Cl.[5] G01D *21/00*
U.S. Cl. 73—651 **4 Claims**



1. A vibration/acceleration sensor comprising:

a basic sensor unit including a vibration detecting unit containing therein a piezoelectric bending vibrator having upper and lower surfaces, a first thin plate and a second thin plate provided respectively on the upper and lower surfaces of said vibration detecting unit,

a signal processing circuit provided on at least one of said first thin plate and said second thin plate,

a casing means for being mounted onto a body whose vibrations are to be detected, and a resinous material enclosing said basic sensor unit;

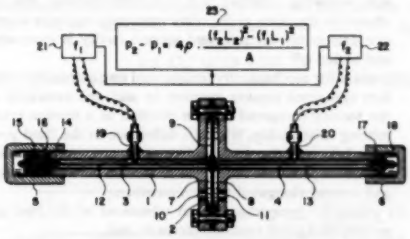
and wherein each of said first thin plate and said second thin plate is formed of a resinous material having a low heat transfer coefficient and include a printed circuit board formed of glass epoxy resin.

5,003,825

DIGITAL PRESSURE SENSOR

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Filed Apr. 17, 1987, Ser. No. 39,383
Int. Cl.[5] G01L *11/00*
U.S. Cl. 73—704 **14 Claims**



1. A pressure measuring apparatus comprising in combination:

(a) a body including a first pressure receiving chamber including a port and at least one deflective end wall for receiving and containing fluid under a pressure therewithin, and a second pressure receiving chamber including a port and at least one deflective end wall for receiving and containing fluid under another pressure therewithin;

(b) a first elongated tension member with one extremity secured to said at least one deflective end wall of the first pressure receiving chamber and extending therefrom in a first direction through a first cavity separated from the first pressure receiving chamber in a leak-proof manner, and anchored to the body at the other extremity opposite to said one extremity;

(c) a second elongated tension member with one extremity secured to said at least one deflective end wall of the second pressure receiving chamber and extending therefrom in a second direction opposite to said first direction through a second cavity separated from the second pressure receiving chamber in a leak-proof manner, and anchored to the body at the other extremity opposite to said one extremity;

(d) means for mechanically linking said one extremity of the first elongated tension member to said one extremity of the second elongated tension member in a tension transmitting relationship, wherein difference in the fluid pressure between the first and second pressure receiving chamber produces difference in tension between the first and second elongated tension members;

(e) means for generating lateral vibrations of the first and second elongated tension members; and

(f) means for detecting natural frequencies of the lateral vibrations of said first and second elongated tension members;

wherein the difference in the fluid pressure between the first and second pressure receiving chambers are determined from the natural frequencies of the lateral vibrations of said first and second elongated tension members.

11. A pressure measuring apparatus comprising in combination:

(a) a body including a first pressure receiving chamber including a port and at least one deflective and wall for

receiving and containing fluid under a pressure therewithin, and a second pressure receiving chamber including a port and at least one deflective end wall for receiving and containing fluid under another pressure therewithin;

(b) a first elongated tension member with one extremity secured to said at least one deflective end wall of the first pressure receiving chamber and extending therefrom in a first direction through a first cavity separated from the first pressure receiving chamber in a leak-proof manner, and anchored to the body at the other extremity opposite to said one extremity; wherein said first cavity is evacuated and sealed off;

(c) a second elongated tension member with one extremity secured to said at least one deflective end wall of the second pressure receiving chamber and extending therefrom in a second direction opposite to said first direction through a second cavity separated from the second pressure receiving chamber in a leak-proof manner, and anchored to the body at the other extremity opposite to said one extremity; wherein said second cavity is evacuated and sealed off;

(d) means for mechanically linking said one extremity of the first elongated tension member to said one extremity of the second elongated tension member in a tension transmitting relationship, wherein difference in the fluid pressure between the first and second pressure receiving chambers produces difference in tension between the first and second elongated tension members;

(e) means for generating lateral vibrations of the first and second elongated tension members; and

(f) means for detecting natural frequencies of the lateral vibrations of said first and second elongated tension members;

wherein the difference in the fluid pressure between the first and second pressure receiving chambers is determined from the natural frequencies of the lateral vibrations of said first and second elongated tension members.

5,003,826

APPARATUS FOR SUPPORTING A LONG CABLE FOR TENSION TESTING

Kin Y. Wong, Renton, and Douglas Thompson, Redmond, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 12, 1990, Ser. No. 491,761
Int. Cl.[5] G01N *3/08*
U.S. Cl. 73—828 **6 Claims**

1. Apparatus for supporting a cable having a first end which is attachable to a cable testing machine and a second end, the apparatus comprising:

a. a frame which is connected to the cable testing machine so as to support the frame in a vertical manner;

b. a drum which is connected to the second end of the frame and which supports a portion of the cable which is wound around the drum; and

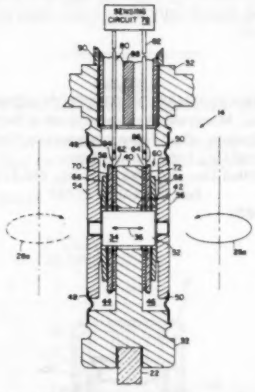
c. means, connected to the frame at a location above the drum, for engaging a portion of the cable which is not wound around the drum so as to prevent movement of the wound portion of the cable relative to the drum when the cable testing machine causes the drum to move relative to the first end of the cable in a vertical direction in order to place the first end of the cable under tension, the cable engaging means including a clamp pad which is fixedly connected to the frame and which has a first curved surface, and a clamp which has a second curved surface having a shape that is complementary to the first surface and which is movably connected to the frame so as to engage the cable between the first and second surfaces in a manner that the cable extends from the drum in an upward direction where it is caused to curve between the first and second surfaces so that the cable exits from the cable engaging means in a generally horizontal manner so as to minimize any bending of the cable, the engaging means being connected to the frame in a manner that the cable extends from the drum at a location near a front edge of the frame in a direction toward a rear edge of the frame such that the portion of the cable engaged by the engaging means continues to extend upward and toward the rear edge of the frame.

5,003,827

PIEZOELECTRIC DIFFERENTIAL PRESSURE VORTEX SENSOR

Richard W. Kalinoski, Rumford, R.I.; Gordon W. Chitty, Norfolk, and James H. Vignos, Needham Heights, both of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed Dec. 22, 1989, Ser. No. 455,058
Int. Cl.[5] G01F *1/32*
U.S. Cl. 73—861.24 **27 Claims**



1. A piezoelectric differential pressure sensor comprising:

a sensor housing having a first and second cavity interconnected by a channel;

a spool-like actuator having an axle slideably disposed in the channel for allowing each of two flange members, connected proximate to each end of the axle, to shuttle back and forth relative to said sensor housing in response to forces applied to the flange members;

piezoelectric sensing means disposed in the first cavity between the flange member and the sensor housing, for

generating signals in response to force mechanically applied to it by the flange members of said actuator; and

means, interconnected to said sensing elements, for detecting the signals generated by said sensing means.

5,003,828

FLOWMETER FOR GASES

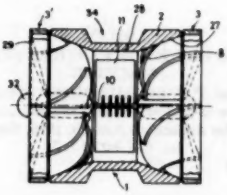
Johannes M. E. van den Burg, Houten, Netherlands, assignor to Mijnhardt B.V., Bunnik, Netherlands

Filed Nov. 14, 1989, Ser. No. 436,375

Claims priority, application Netherlands, Nov. 15, 1988, 8802809

Int. Cl.[5] G01F *1/10*

U.S. Cl. 73—861.33 **11 Claims**



1. A flowmeter for gases, comprising a sensor having a housing which is open at two opposite ends for the infeed and discharge of the gases to be measured, and in which a rotor is rotatable about an axis between two stators which are substantially at right angles to the said axis and which comprise deflection blades, while optical means are provided to detect the rotation of the rotor and convert it into an electrical output signal, wherein each of the stator deflection blades is curved between an inflow edge, where the blade from the hub to the periphery extends substantially in an axial plane, and an outflow edge, where the blade surface at each point thereof forms an angle with the axial direction which angle varies with the distance of each said point from the hub.

5,003,829

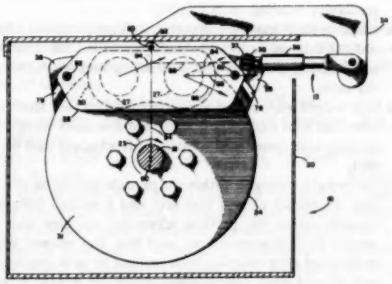
ENERGY ABSORBING DEVICE AND TORQUE MEASURING APPARATUS THEREFOR

John P. DeConti, 328 Maple St., New Britain, Conn. 06051, and Raymond N. Quenneville, Suffield, Conn., assignors to John P. DeConti, New Britain, Conn.

Filed Sep. 29, 1989, Ser. No. 415,086

Int. Cl.[5] G01L *3/16*; F16D *65/853*

U.S. Cl. 73—862.12 **66 Claims**



29. A device for applying and measuring torque to a rotating disc, comprising:

(A) at least one pair of opposing friction pads for positionment about the rotating disc so as to frictionally engage the rotating disc and thereby apply a retarding torque to the rotating disc;

(B) a caliper having means for retaining the friction pad pair about the rotating disc;

(C) means connected to the friction pads, for frictionally engaging the pads against the rotating disc; and

(D) a force detector coupled to the caliper so as to be in alignment with the resultant force vector of the friction pad pair;

whereby the force measured by the force detector is a direct measure of the torque applied to the rotating disc by the friction pad pair.

5,003,830

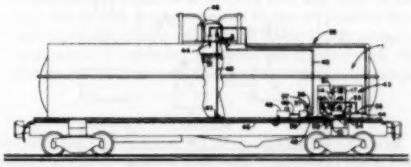
SAMPLE EXTRACTION SYSTEM

R. Wilson Spencer, P.O. Box 22586, Houston, Tex. 77227

Continuation-in-part of Ser. No. 304,815, Jan. 31, 1989, abandoned, which is a continuation of Ser. No. 55,720, May 29, 1987, Pat. No. 4,800,761. This application Nov. 13, 1989, Ser. No. 435,935

Int. Cl.[5] G01N *1/14*

U.S. Cl. 73—863.83 **8 Claims**



1. In combination with a wheeled transport tank having a reservoir, an improvement comprising a sample extraction system fixedly attached to said wheeled transport tank, including:

a. a suction line extending into said reservoir;

b. a circulating means, for circulating fluid from said reservoir, having a suction port and a discharge port; said suction port being connected to said discharge suction line;

c. a discharge line having a first and a second end, connected at said first end to said discharge port;

d. a block fitting, including:

i. an inlet connected to said second end of said discharge line;

ii. an outlet;

iii. an interior passageway, providing communication between said inlet and said outlet thereby allowing fluid to flow through said block fitting;

iv. a pressure reducing means, for causing a pressure drop within said interior passageway, positioned within said interior passageway;

v. a sample port;

vi. a sample passageway, connecting said interior passageway and said simple port between said inlet and said pressure reducing means;

vii. a reentry port; and

viii. a reentry passageway, connecting said reentry port and said pressure reducing means;

e. a return line, connected on one end to said outlet of said block fitting and terminating within said reservoir;

f. a sample container, having an inlet and an outlet;

g. a sample inlet line, connected on one end to said sample port, and on the other end to said inlet of said sample container;

h. a sample inlet valve, positioned in said sample inlet line;

i. a sample exit line, connected on one end to said outlet of said sample container, ad on the other end to said reentry port; and

j. at least one sample exit valve, positioned in said sample exit line; and

wherein said system defines a closed loop beginning and ending at said reservoir.

5,003,831

PROCESS FOR MONITORING A DEVICE FOR AUTOMATICALLY DETECTING AND EVALUATING SURFACE CRACKS

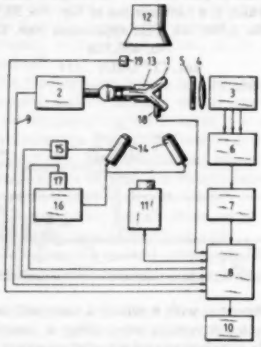
Rainer Link, Kerpen-Horrem, and Wolfgang Nuding, Troisdorf, both of Fed. Rep. of Germany, assignors to Isotopenforschung Dr. Sauerwein GmbH, Haan, Fed. Rep. of Germany

Filed Dec. 29, 1989, Ser. No. 458,586

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1989, 3907732

Int. Cl.[5] H04N *7/18*

U.S. Cl. 73—865.9 10 Claims



1. A process for monitoring a device for automatically detecting and evaluating surface cracks in articles by means of magnetic powder or by a dye penetration process in which a sorting result is triggered by means of an image pick-up device and a digital image processing and control unit, comprising the steps of projecting a typical defect pattern by means of a projector onto a surface of an article to be examined in a pick-up region of the image pick-up device, and establishing a defect indication of the defect pattern.

5,003,832

MOTION TRANSMITTING MECHANISM

Stig G. Carlqvist, Paris, France, assignor to Stig G. Carlqvist Motor Consultant, (C.M.C.) Aktiebolag, Malmo, Sweden

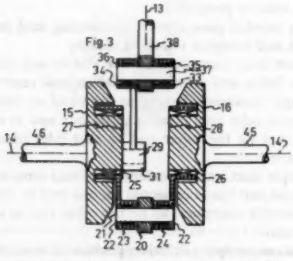
PCT No. PCT/SE88/00030, § 371 Date Jun. 28, 1989, § 102(e) Date Jun. 28, 1989, PCT Pub. No. WO88/05878, PCT Pub. Date Aug. 11, 1988

PCT Filed Jan. 28, 1988, Ser. No. 378,219

Claims priority, application Sweden, Jan. 28, 1987, 8700321

Int. Cl.[5] F16M *21/18*

U.S. Cl. 74—51 13 Claims



1. A motion transmitting mechanism for a machine, such as a heat engine, refrigerating machine and heat pump, which is hermetically sealed or provided with a rotary shaft seal, said machine having at least one reciprocating piston connected to the motion transmitting mechanism by means of connecting rods, characterized in that the motion transmitting mechanism has two counterrotating crank systems which are centered along a single center line, whereby lateral forces of the piston counteract each other and thus are eliminated.

5,003,833

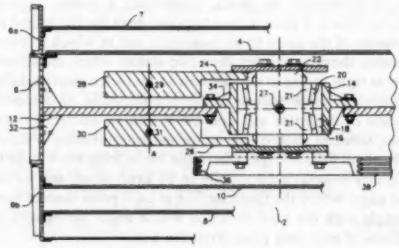
GYRATING DRIVE FOR PARTICLE SCREENING MACHINE

Luis F. Antezana, P.O. Box 1419, Mercer Island, Wash. 98040

Continuation-in-part of Ser. No. 386,958, Jul. 28, 1989, abandoned. This application Apr. 23, 1990, Ser. No. 512,548

Int. Cl.[5] B07B *1/28*

U.S. Cl. 74—87 10 Claims



1. A drive imparting substantially horizontal planar gyrational motion for a particle screening machine having at least two side walls, said drive comprising:

a stationary bearing support plate attached to the side walls, said stationary bearing support plate having an opening therein, said stationary support plate and said walls providing structural integrity of said drive during said gyrational motion of said drive;

a stationary hub fixedly mounted to said support plate in registration with said opening;

a bearing assembly mounted in said hub, said bearing assembly including bearings, a rotatable bearing race, and a stationary bearing race;

a rotatable shaft having a first end, a second end and a longitudinal axis, said rotatable shaft journalled for rotation in said bearing assembly and contacting said rotatable bearing race;

a first weight supporting arm connected to said shaft adjacent said first end of said shaft and a second weight supporting arm connected to said shaft adjacent said second end;

a first weight arranged within the particle screening machine and connected to said first arm and a second weight arranged within the particle screening machine and connected to said second arm, said first and second weight positioned eccentrically with respect to said longitudinal axis of said shaft and rotating therewith in said housing; and

a driving means coupled to said rotatable shaft whereby rotation of said shaft and of said weights imparts gyrational motion to said drive.

5,003,834

SERVO SYNCHRONIZATION WITH MECHANICAL INTER LOCK

Erich R. Muller, Hohe Strasse 15, D-7110 Ohringen-Cappel; Gunther Priwitzer, Hofgartenweg 20, D-7110 Ohringen, and Felix Martin, Hermann-Hagenmeyer-Strasse 16, D-7113 Neuenstein, all of Fed. Rep. of Germany

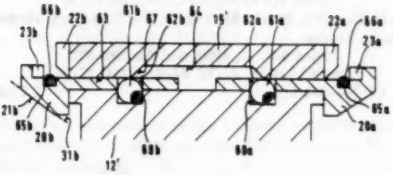
PCT No. PCT/DE88/00585, § 371 Date Jul. 21, 1989, § 102(e) Date Jul. 21, 1989, PCT Pub. No. WO89/02995, PCT Pub. Date Apr. 6, 1989

PCT Filed Sep. 21, 1988, Ser. No. 372,344

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1987, 3732525

Int. Cl.[5] F16H *3/38;* **F16D** *23/06*

U.S. Cl. 74—339 **5 Claims**



1. A multi-range transmission, for motor vehicles, with a first gear and a second gear located next to one another on a first shaft and synchronizing means located between the first and second gears and movable axially with respect thereto for synchronizing the speed for the two gears, whereby a synchronizing ring of the synchronizing means, which rotates with the first gear, is rotatable only a limited portion with respect to the first gear and has a circumferential friction surface which, when actuating element is moved axially, can be brought with an opposing friction surface of the second gear, the synchronizing ring has an inclined surface, inclined with respect to a radial plane which contacts an inclined surface of the first gear so that when frictional engagement between the two friction surfaces occurs and axial force directed toward the opposing friction surface is applied to the synchronizing ring, the first gear rotates with and the second gear rotates on the first shaft, the second gear engages a third gear which rotates with a second shaft aligned parallel to the first shaft, and a shift sleeve is movable over the first and second gears to lock the two gears together, wherein a synchronizing ring is provided on each side of the first gear, and blocking means is provided to prevent axial movement of one of the synchronizing rings when the other synchronizing ring is moved.

5,003,835

TORQUE SUPPORT FOR DRIVES RIDING ON TRUNNIONS, PARTICULARLY FOR CONVERTER TILT DRIVES

Wilhelm Ackermann, Essen; Karlheinz Langlitz, Mülheim, and Günter Schmitz, Duisburg, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Aug. 1, 1989, Ser. No. 388,562

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1988, 3827329

Int. Cl.[5] F16H *55/22, 37/06;* **B29C** *39/12;* **F16F** *9/00*

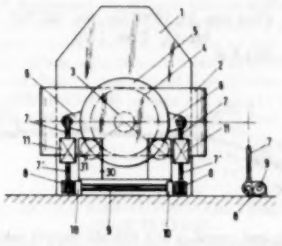
U.S. Cl. 74—411 **5 Claims**

1. A torque support for drives riding on trunnions, in particular for converter tilt drives, including a gear housing mounted on said trunnion which is rotatable about an axis of rotation, a drive motor attached by a flange or bolting to a step-down gearing which engages, via pinion, with a large gear wheel fixed for rotation on the trunnion, said torque support comprising:

a pair of guide rods located symmetrically to said axis of rotation of said trunnion, each guide rod (7) comprising a first and second oppositely positioned part (7,7'), said first and second guide rod part having an upper and lower end and a respective free end opposite thereto;

means for pivotally mounting said upper ends on said gear housing;

means for pivotally attaching each of said lower ends to means for interconnecting said lower ends to each other,



said interconnecting means comprising a member deformable by one of compression-tension or torsion; and

a spring element (11) for connecting said free ends of said first and second guide rod parts in spaced relation from said mounting means, said spring element (11) acting in tension and compression and comprising springs (16, 16') and means for predeterminately pre-stressing said springs.

5,003,836

WORM GEAR MOTOR WITH A BUILT-IN SENSOR

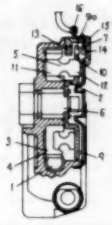
Teruyuki Mitsugu, Nanjyou, and Norio Umezawa, Takefu, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 7, 1989, Ser. No. 376,595

Claims priority, application Japan, Jul. 8, 1988, 63-91329[U]

Int. Cl.[5] F16H *1/16*

U.S. Cl. 74—425 **2 Claims**



1. A worm gear motor having a built in sensor means, comprising:

a motor shaft;

a worm gear on said motor shaft;

a rotatably mounted worm wheel in mesh with said worm gear;

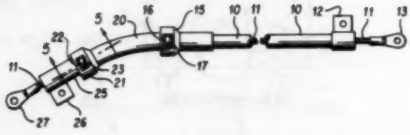
a torque transmission plate connected with said worm wheel for rotation therewith and having an output shaft in the center thereof and at least one circumferentially extending notch in a rim portion thereof;

a magnetic disposed on one side of said torque transmission plate in a position along a path of movement of notch during rotation of said torque transmission plate; and

a magnetic sensor mounted separately from said magnet and on the other side of said torque transmission plate opposite said magnet for being exposed to magnetic flux from said magnet when said notch is between said magnet and said magnetic sensor, said magnetic sensor consisting of a reed switch having reeds movable in response to the presence or absence of magnetic flux the magnetic flux from said

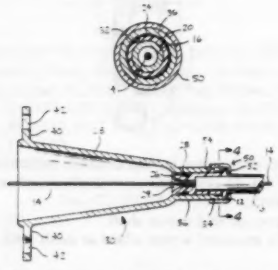
magnet into and out of contact for making and breaking a circuit as said notch and said rim portion pass between said magnet and said reed switch.

5,003,837
CURVED CABLE END CONNECTOR
Anthony J. Italiano, Waukesha, Wis., assignor to Orschlen Co., Moberly, Mo.
Filed Jun. 25, 1990, Ser. No. 542,765
Int. Cl.[5] F16C 1/10
U.S. Cl. 74—501.5 R 12 Claims



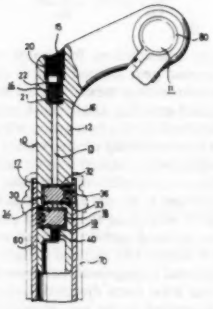
1. A cable end coupling and flexible control cable comprising:
a. a flexible control cable movably supported in a flexible conduit and having an end of said cable extending from an end of said conduit;
b. said conduit end terminating in an enlarged female receptacle;
c. A relatively rigid elongated coupling having a curved central axis and including an internal passageway extending along said curved axis for the length of said coupling for receiving and permitting movement of said cable through said coupling;
d. said coupling including a male end means for securing said coupling to said female receptacle while permitting rotation of said coupling relative to said conduit.

5,003,838
CABLE ROUTING END FITTING ASSEMBLY
Joseph Pospisil, Royal Oak, and Arthur L. Spease, Bloomfield Hill, both of Mich., assignors to Teleflex Incorporated, Limerick, Pa.
Filed Apr. 10, 1990, Ser. No. 506,940
Int. Cl.[5] F16C 1/10
U.S. Cl. 74—502.4 15 Claims



1. A motion transmitting remote control assembly (10) of the type for transmitting forces in a curved path by a flexible motion transmitting core element (14), said assembly comprising: a first conduit (16) having a first end and a second end and a second conduit (38) having a first end and a second end, a core element (14) slideably supported in both of said first and said second conduits, a male end fitting (20) disposed about the second end of the first conduit (16), a female end fitting (30) disposed about the first end of the second conduit (38) for telescoping engagement with said male end fitting (20) to an assembled position, retaining means (50) for retaining said male end fitting (20) to said female end fitting (30) when in said assembled position, said assembly characterized by locking means (24,32) having locking teeth for providing said telescoping engagement between said male (20) and said female end fittings (30) at incremental rotational positions relative to one another while preventing any relative rotational movement between said male (20) and said female (30) end fittings, whereby said male (20) and female end fittings (30) may be telescoped together in any one of various incremental rotational positions and locked therein.

5,003,839
STEM HAVING A FIXING DEVICE
Wen C. Yang, No. 68, Hsi Sheh Rd., Ching Shui Chen, Taichung Hsien, Taiwan
Filed Sep. 21, 1990, Ser. No. 586,602
Int. Cl.[5] B62K 21/18, 21/02; F16L 17/00
U.S. Cl. 74—551.1 2 Claims



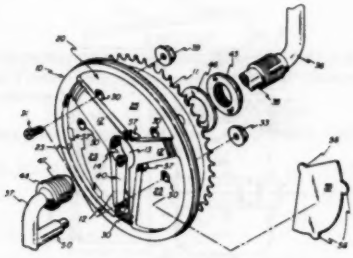
1. A fixing device being provided for fixing a stem to a head tube of a bicycle; said stem having a vertical tube which has an aperture longitudinally formed in a center thereof; a first hole being formed in an upper end of said vertical tube and communicated with said aperture, an inner thread being formed in an upper part of said first hole; a spring being received in an inner end of said first hole; a first bolt being threadedly engaged with said inner thread of said first hole, a lower end of said first bolt being contacted with said spring; a second hole and a third hole which are communicated with said aperture being laterally formed in a lower portion of said vertical tube and each having an open end and a close end, said second hole being located higher than said third hole, said open ends of said second hole and said third hole being opposite with other; a piston which has at least one notch formed in a head portion thereof being received in each of said second hole and said third hole, said head portion of said piston facing said close end of either of said second hole or said third hole; a ring element being fixed to an outer end of each of said pistons; a screw hole being formed in a lower end of said vertical tube and communicated with said third hole, a second blot being threadedly engaged within said screw hole; an oil being filled within said aperture, said first hole, said second hole and said third hole; when said first bolt is threaded into said first hole, said oil being pressurized and having a tendency to flow into a space between said head portion of each of said pistons and said close end of either of said second hole or said third hole so that said head portions of said pistons are pushed outward in order that said ring elements are pushed to engage with an inner surface of said head tube, and so that said stem can be stably and firmly fixed to said head tube.

5,003,840

COVER FOR THE DRIVING SPROCKET OF A BICYCLE

Robert A. Hinschlager, Mendon, Ohio, assignor to Huffy Corporation, Miamisburg, Ohio

Filed Nov. 6, 1989, Ser. No. 432,253
Int. Cl.[5] G05G 1/14; F16H 55/30; B62J 13/00
U.S. Cl. 74—594.2 7 Claims



1. For use on a bicycle having a driving socket of predetermined diameter mounted on a crankshaft, a cover for such sprocket comprising:

(a) a main body of circular shape proportioned to overlie such sprocket and having an outer face,

(b) said body including a plurality of spoke portions radiating outwardly from a central hub portion and having radially outer ends,

(c) said spoke portions being of channel shape in section to provide side walls thereon,

(d) said hub portion having a central hole therethrough for receiving said crankshaft,

(e) said body also including a peripheral rim portion connected with said radially outer ends of said spoke portions and cooperating therewith to define a plurality of open areas,

(f) said rim portion having a rearwardly extending radially inner side wall,

(g) said body including a wall portion which forms a back for each of said open areas and is connected with said side walls of adjacent said spoke portions and said rim portions to define therewith a corresponding series of pockets in said outer face of said body;

(h) means for mounting said body on such driving sprocket, and

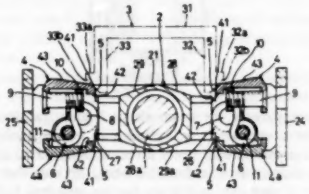
(i) a panel mounted in each of said pockets.

5,003,841

BICYCLE PEDAL

Masashi Nagano, Osaka, Japan, assignor to Shimano Industrial Co., Ltd., Osaka, Japan

Filed Aug. 11, 1989, Ser. No. 392,338
Claims priority, application Japan, Aug. 12, 1988, 63-202574
Int. Cl.[5] G05G 1/14
U.S. Cl. 74—594.4 10 Claims



1. A bicycle pedal comprising:

a pedal body supported by a pedal shaft for rotation about an elongated axis (L) of the pedal shaft,

at least one clamp member (4) attached to the pedal body for clamping a cleat (3), the clamp member being displaced in a fore and aft direction from the axis of the pedal shaft to be movable between a cleat clamping position and a cleat release position,

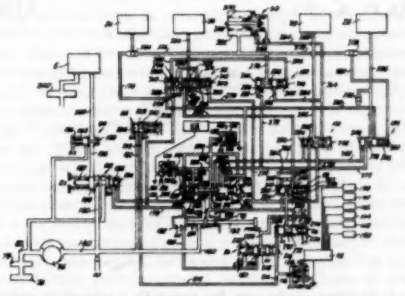
said at least one clamp member (4) is pivotable about a pivot shaft (7, 8) disposed substantially parallel to said axis (L) of the pedal shaft between said cleat clamping position and said cleat release position, and said at least one clamp member defines a guide surface (43) adjacent the axis of said pedal shaft for guiding said cleat (3) from said at least one clamp member (4) toward said axis (L) of the pedal shaft for securing said cleat to said at least one clamp member.

5,003,842

CONTROL DEVICE FOR AUTOMATIC TRANSMISSION GEAR SYSTEM

Katuhiro Hattu; Takeo Hiramatsu, and Bonnosuke Takamiya, all of Kyoto, Japan, assignors to Mitsubishi Jidoshai Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 463,935, Jan. 8, 1990, abandoned, which is a continuation of Ser. No. 267,667, Nov. 4, 1988, abandoned, which is a continuation of Ser. No. 81,586, Aug. 3, 1987, abandoned, which is a continuation of Ser. No. 912,686, Sep. 26, 1986, abandoned, which is a continuation of Ser. No. 530,642, Sep. 9, 1983, abandoned. This application Sep. 25, 1990, Ser. No. 590,601
Claims priority, application Japan, Sep. 10, 1982, 157644
Int. Cl.[5] B60K 41/06
U.S. Cl. 74—867 5 Claims



1. A control device for an automatic transmission gear system having a change speed gear assembly with plural gear ratios between an input shaft and an output shaft, comprising:

first frictional element means actuated by fluid pressure to obtain one of said gear ratios for lower speed driving;

an actuating means for actuating said first frictional element means, having first fluid chamber means to which fluid pressure is supplied to activate said first frictional element means, and second fluid chamber means from which fluid proportional to fluid pressure supplied to said first fluid chamber is exhausted;

second frictional element means actuated by fluid pressure to obtain another one of said gear rations for high speed driving;

third fluid chamber means to which fluid pressure is supplied to activate said second frictional element means;

a fluid passage which connects said second fluid chamber means with said third fluid chamber means;

an exhaust passage for exhausting fluid from said fluid passage and connected to said fluid passage when shifting from higher to lower speed driving;

an orifice with an unchangeable opening provided in said exhaust passage for regulating amount of fluid to be exhausted;

a synchronization detection means for detecting whether said gear ratios have been obtained;

switching valves for switching fluid passages leading to said frictional element means at a time of shifting between higher and lower speed driving;

a fluid pressure regulating means, having a fluid pressure control solenoid valve, for controlling sum of transmittable torque of said first and second frictional element means by modulating the fluid pressure supplied to said first fluid chamber means during shifting from higher to lower speed driving;

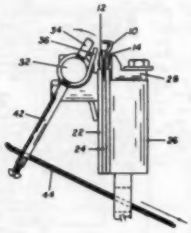
an electronic control device for controlling said fluid pressure control solenoid valve to control said sum of transmittable torque in such a way that, said sum of transmittable torque is decreased when disengagement of the second frictional element means is detected by said synchronization detection means and said sum of transmittable torque is increased when engagement of the first frictional element means is detected by said synchronization detection means.

5,003,843

SAW CHAIN HOLDING MECHANISM FOR GRINDING MACHINES

James E. Shepherd, P.O. Box 2719, White City, Oreg. 97503

Filed May 17, 1990, Ser. No. 524,568
Int. Cl.[5] B23D *63/16*
U.S. Cl. 76—78.1 **6 Claims**



1. Holding mechanism for use with a saw chain grinding machine having a saw chain holding bar with an edge slot which receives the drive tines of cutter elements of the saw chain for supporting the chain in a stationary position for grinding, said holding mechanism comprising:

base means arranged to be disposed on a saw chain grinding machine in adjacent relation to a saw chain holding bar,

movable means on said base means arranged for selected movement relative to the saw chain holding bar,

first and second projections on said movable means,

said first projection being arranged to engage and hold a cutter element down and said second projection being arranged to engage and hold a cutter element laterally against a defining side wall of the edge slot of the saw chain holding bar in a selected movement of said movable means,

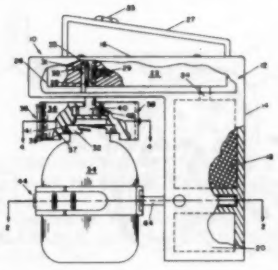
said second projection engaging the cutter element prior to said first projection to position the cutter element against the defining side wall of the edge slot of the saw chain holding bar prior to engagement of the cutter element by said first projection.

5,003,844

PORTABLE CONTAINER OPENER

Bennie W. Barrow, 105C Northway Dr., Clarksville, Tenn. 37042

Filed Feb. 12, 1990, Ser. No. 478,448
Int. Cl.[5] B67B *7/18*
U.S. Cl. 81—3.2 **14 Claims**



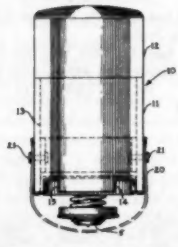
1. A portable device for removing a threaded cover from a container consisting of a housing having a carrying handle, a vertical portion and a horizontal portion; an electric motor mounted adjacent said horizontal portion in the vertical portion of said housing, said motor having a drive shaft which extends upwardly into said horizontal portion; a power supply adapted to drive said motor; a switch adapted for selective actuation of said motor; a drive mechanism mounted in said horizontal portion of said housing and driveably attached to said shaft of said motor; a driven shaft attached to said drive mechanism for rotation thereby, said shaft being laterally spaced from said vertical portion of said housing and extending downwardly from said horizontal portion of said housing; a first gripping means attached to said driven shaft, said first gripping means being adapted to grip said threaded cover; and a second gripping means attached to the vertical portion of said housing, said second gripping means being adapted to grip said container, whereby upon actuation of said motor by operation of said switch said threaded cover will be rotated relative to said container.

5,003,845

RADIATOR CAP REMOVER

James P. Roy, 5903 Mieras Rd., and James P. Harris, 1810 Birchfield Rd., both of Yakima, Wash. 98901

Filed Sep. 29, 1988, Ser. No. 250,938
Int. Cl.[5] B67B *7/18*
U.S. Cl. 81—3.4 **8 Claims**



1. An apparatus for removing a lugless radiator cap, the apparatus comprising: a cylindrical body having defined within one end of said body a recess adapted to receive said cap, the diameter of said recess being greater than the outer diameter of said cap, said body having attached to its exterior a strap of resilient material, such that said strap may be drawn

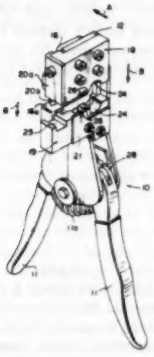
across said recess, whereby said cap is frictionally engaged by said strap within said apparatus when said apparatus is placed over said cap.

5,003,846

OPTICAL FIBER CABLE-STRIPPING DEVICE

Hiroshi Yagawa, Tokyo, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 12, 1990, Ser. No. 508,757
Claims priority, application Japan, Apr. 14, 1989, 1-43867
Int. Cl.[5] H02G 1/12
U.S. Cl. 81—9.42 6 Claims



1. A tool for stripping outer and inner jackets from a transmission cable, comprising:

upper and lower guide members normally spaced from one another defining an opening therebetween;

first and second guide means on said guide members;

operating means connected to said guide members to move them toward and away from one another;

cutting blade means mounted onto said guide members and having first and second cutting sections aligned respectively with said first and second guide means;

a support surface on one of said guide members and a cutting member on the other of said guide members in alignment with said support surface;

said first guide means accommodating an end of the outer jacket of the cable;

hold-down means positioned adjacent said cutting blade means for engaging and holding the cable when the guide members move toward each other causing the first cutting section to cut the outer jacket to the inner jacket whereby upon movement of the tool and cable relative to each other an end section of the outer jacket is stripped from the cable exposing an end section of fused inner jackets;

the exposed end fused inner jackets being slit add separated by said cutting member while being supported on said support surface; and

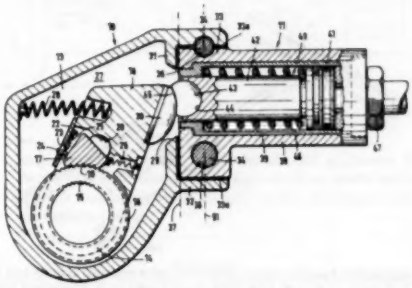
said second guide means accommodating the separated ends of the inner jackets while said hold-down means engages the cable when the guide members move toward each other causing the second cutting section to cut the inner jackets to the transmission members whereby upon movement of the tool and cable relative to each other end sections of the inner jackets are stripped from the cable exposing the transmission members.

5,003,847

HYDRAULIC POWER WRENCH

Paul-Heinz Wagner, Haus Nr. 70, D-5203 Much-Birrenbachshöhe, Fed. Rep. of Germany

Continuation of Ser. No. 411,132, Sep. 22, 1989, abandoned. This application Aug. 15, 1990, Ser. No. 569,260
Claims priority, application European Pat. Off., Oct. 1, 1988, 88116273
Int. Cl.[5] B25B 13/46
U.S. Cl. 81—57.39 5 Claims



1. A hydraulic power wrench comprising a wrench head, said wrench head having a chamber and a connecting portion, a rotatable ring member housed in said chamber, lever means having a first end portion in driving relationship to said ring member for imparting rotation thereto, a cylinder housing, said cylinder housing including a fluid motor including movable member means movable along a longitudinal axis thereof for imparting motion to a second end portion of said lever means, said cylinder housing having a connecting portion, said connecting portions being in generally telescopic interconnected relationship to each other, said connecting portions have cooperative male and female locking means for selectively coupling and uncoupling said wrench head and cylinder housing, said cylinder housing and wrench head connecting portions defining a plane of relative telescopic insertion which is transverse to the longitudinal axis of said movable member means, said male and female locking means defining a plane of locking connection which is transverse to the longitudinal axis of said movable member means, said telescopic insertion plane being disposed generally between said locking connection plane and said lever means, said telescopic insertion plane and locking connection plane being in general parallel relationship to each other, said male and female locking means including first and second locking portions carried by respective ones of said connecting portions, said first locking portion including at least one slot having a longitudinal axis, said second locking portion including at least one projection having a longitudinal axis and being slidably received in said slot, said longitudinal axis of said at least one slot and of said at least one projection lying generally transverse to the longitudinal axis of said movable member means.

5,003,848

MECHANICAL TOOL FOR MANIPULATING FITTINGS AND CAPS

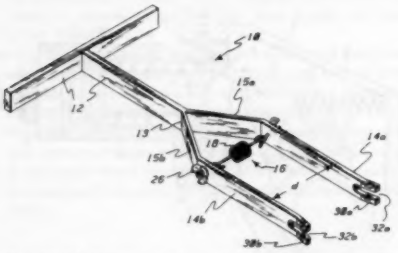
Rudolph R. Ceccucci, Jr., 66 Third St., Cohoes, N.Y. 12047

Filed Jun. 22, 1990, Ser. No. 542,023
Int. Cl.[5] B25B 13/16
U.S. Cl. 81—176.2 7 Claims

1. A mechanical tool for manipulating from a coaxial direction a hose fitting or cap having two circumferentially positioned, substantially diametrically opposed outwardly projecting lugs, the hose fitting having a hose connected thereto, said tool comprising:

a handle;

said handle having two elongate resilient branches extending from one end thereof, a free end of each branch having an opening therein, said branches being spaced and said openings being sized such that said openings engagably receive a respective one of said cap or fitting lugs when said tool is oriented coaxially to and positioned in contact with one of the cap and hose fitting, said branches being sufficiently elongate to accommodate therebetween a sufficient portion of said hose to allow the tool to engage the hose fitting from a coaxial direction; and



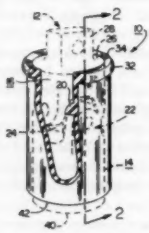
adjustable biasing means disposed between and connected to said branches for adjusting the resiliency of and distance between said branches, said adjustable biasing means being located between said one end of said handle and said free ends of said branches, said biasing means being disposed so as not to interfere with the use of said tool in manipulating the hose fitting or cap from a coaxial direction, said adjustable biasing means allowing said branches to be tensioned to securely engage said fitting or cap when in use and to adjust to engage hose fittings and caps of different diameters.

5,003,849

ALIGNMENT SLEEVE FOR HAND TOOL HAVING A UNIVERSAL JOINT

Warwick W. Lawrie, 116 Westfield Dr., Nashville, Tenn. 37221

Filed May 14, 1990, Ser. No. 523,062
Int. Cl.[5] B25B *23/00*
U.S. Cl. 81—184 **10 Claims**



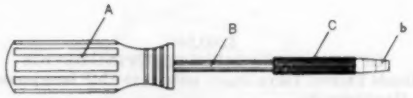
1. In an alignment device for a hand tool employing a universal joint having a first end for attachment to the drive means of said tool, a second end for attachment to the driven means of said tool and an intermediate section pivotally attached between said first end and said second end, said device including a resilient, non-metallic sleeve formed into a hollow cylindrical shape for frictional contact with the outer surfaces of said universal joint to limit the magnitude of movement of said universal joint when said universal joint is subjected to lateral forces, the improvement comprising at least one pair of arcuate shaped ribs for interlocking with said intermediate section and one of said first and said second ends for limiting the movement of said sleeve with respect to said universal joint.

5,003,850

SCREWDRIVER WITH HOLDING SLEEVE

James J. Harkins, 300 N. River Rd. #310, Manchester, N.H. 03104

Filed Jun. 4, 1990, Ser. No. 521,411
Int. Cl.[5] B25B *23/00*
U.S. Cl. 81—436 **1 Claim**



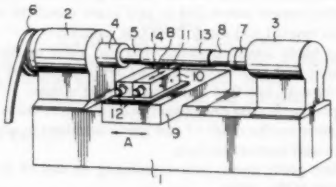
1. A screwdriver having a shaft extending along a longitudinal rotational axis, a bit attached to one end of said shaft and extending along said longitudinal rotational axis, a handle attached to a second end of said shaft and extending along said longitudinal rotational axis, a tubular sleeve being co-axial with said shaft and slidable thereon, said bit having a shoulder formed with a bearing surface thereon for engagement with one end of said sleeve; said shaft, bit, and handle being rotatable relative to said sleeve about said longitudinal rotational axis.

5,003,851

METHOD OF MANUFACTURING A PHOTORECEPTOR

Sunao Kawada; Takayoshi Hashimoto; Toyotsugu Itoh, all of Hachioji, and Makoto Koyanagi, Fuchu, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Oct. 18, 1989, Ser. No. 423,024
Claims priority, application Japan, Oct. 20, 1988, 63-262837
Int. Cl.[5] B23B *3/00*
U.S. Cl. 82—1.11 **9 Claims**



1. A method of finishing the surface of a photoreceptor base drum by using a lathe-turning machine, the method comprising the steps of:

providing a cutting tool having a rake surface, a front flank surface, and a main cutting edge defined by at least a portion of the juncture of the rake surface and the front flank surface, the main cutting edge including a curved surface having a radius of curvature in the range of about 0.15 to 3.5 μm;

rotating the photoreceptor base drum on its axis in the lathe turning machine;

positioning the curved surface of the main cutting edge into cutting engagement with the surface of the rotating photoreceptor base drum; and

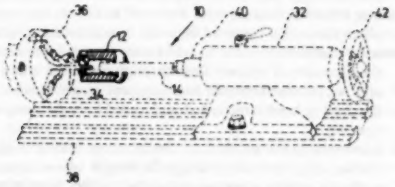
moving the engaged cutting tool in the axial direction of the rotating photoreceptor base drum for providing the surface of the photoreceptor base drum with a mirror-like finish.

5,003,852

BUTTON DIE HOLDER

Michael J. Kelly, 10422 Homeland Ave., Whittier, Calif. 90603

Filed Jul. 27, 1987, Ser. No. 78,168
Int. Cl.[5] B23G 5/00
U.S. Cl. 82—158 1 Claim



1. A new and improved button die holder for use with a metal cutting lathe, said die holder comprising:

die housing means for holding a button die:

and

guide bar means upon which die housing means is slidably positioned, said guide bar means serving to guide said die housing means and said button die into a thread cutting engagement with a workpiece operably mounted in said lathe, said guide bar means being slidably positionable through substantially an entire length portion of said die housing means, thereby to provide maximum stability to said die during said thread cutting engagement, and wherein said guide bar means is selectively abutable against said button die retained within said die housing means, and wherein said die housing means is of a cylindrical construction and includes a through-extending axially aligned aperture in which said guide bar means is positioned, and wherein said guide bar means is of a cylindrical construction and is designed to be retained within a tailstock associated with said lathe, and wherein said workpiece is retained within a headstock associated with said lathe, and wherein said workpiece extends into an interior portion of said die housing means during said thread cutting engagement, and wherein said interior portion comprises said aperture, and wherein said guide bar means is provided for with an axially aligned forwardly positioned bore which defines a hollow interior portion of said guide bar means, and wherein said guide bar means remains substantially positioned within an entire length portion of said aperture.

5,003,853

CUT-OFF DIE SET

John J. Borzym, Birmingham, and Alexander Borzym, West Bloomfield, both of Mich., assignors to Alpha Industries, Inc., Novi, Mich.

Continuation of Ser. No. 237,527, Aug. 26, 1988, Pat. No. 4,932,297. This application Feb. 2, 1990, Ser. No. 474,535
Int. Cl.[5] B26D 1/60
U.S. Cl. 83—318 8 Claims

1. In a cut-off die apparatus of the double cut type in which sections of tubing are successively severed from a continuous length of tubing moving along a generally horizontally axial path by a notching cut performed by a notching blade mounted on a cross slide for reciprocal movement horizontally across the tube path followed by a vertical severing cut, the improvement wherein the means mounting the notching blade on the cross slide comprises:

(A) means defining a vertical guideway on said cross slide;

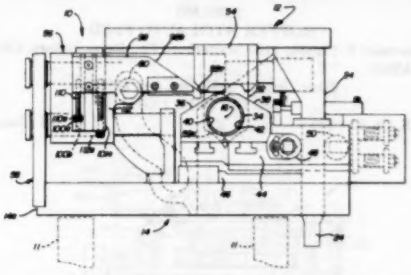
(B) a notching blade holder;

(C) means for securing said notching blade to one end of said holder;

(D) a vertically extending slide member slidably received in said guideway;

(E) means for infinitely varying the vertical adjustment of said notching blade holder; and

(F) means for coupling said notching blade holder to said



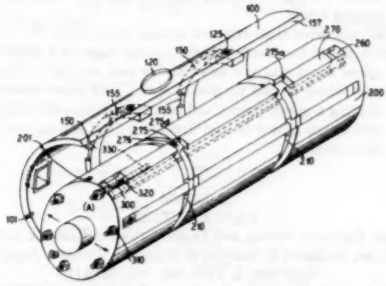
slide member operable to sandwich said guideway between said slide member and said notching blade holder thereby locking said slide member in any position of vertical adjustment.

5,003,854

DEVICE FOR FASTENING A DIE ON A TOOL CARRIER CYLINDER OF A ROTARY MACHINE

Bernard Capdebosco, Saint-Just-Chaleyssin, France, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 23, 1990, Ser. No. 483,621
Claims priority, application France, Feb. 24, 1988, 89 02729
Int. Cl.[5] B26D 7/26
U.S. Cl. 83—331 11 Claims



1. A device for fastening a die on a tool carrier cylinder of a rotary machine, said device comprising the die being provided on an inner surface with an adequate number of parallel extending ribs with each rib having a pair of side walls and an inner face and a base extending therebetween, said inner face spaced from being the inner surface of the die, one side wall of each of said ribs facing in the same direction and having an oblique surface portion being oriented outwardly with the inner face of the rib being broader than the base of the rib at each oblique surface portion, said tool carrier cylinder being provided on an outer surface with a first row of circular cross grooves constructed for receiving said ribs of the die, said cylinder having a second row of longitudinal grooves deeper than the first row of grooves, a locking rod being disposed in each of the longitudinal grooves, said longitudinal grooves having means to prevent radial movement of the rods and enabling movement along the length of said longitudinal grooves, each of said locking rods at a level of the circular cross grooves having a cross slot of a size equal to the cross sectional size of each of the ribs, and means for moving said rods to cause second oblique surfaces disposed in the circular

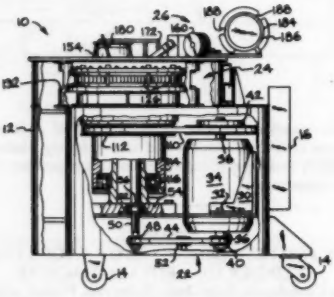
cross grooves and cross slots to engage the oblique surface portions of each of the ribs to hold the ribs in said circular cross grooves and to hold the die on said carrier cylinder.

5,003,855

CHOPPER WITH AUTO FEED

Lawrence F. Clupak, 1106 Matterhorn Dr., Reynoldsburg, Ohio 43068

Filed Jan. 23, 1989, Ser. No. 299,582
Int. Cl.[5] D01G *1/04*
U.S. Cl. 83—346 18 Claims



1. An apparatus for cutting strands of material into short lengths comprising, in combination,

means for supporting a plurality of circumferentially spaced apart, radially oriented blades about an axis, said blades having inwardly disposed cutting edges,

a first drive shaft disposed on said axis coupled to said supporting means,

a wheel having an annular surface disposed adjacent said cutting edges,

a second drive shaft coupled to said wheel, and

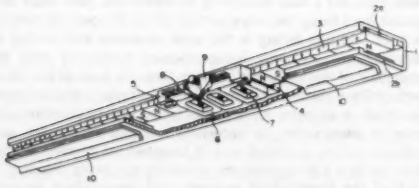
drive means for revolving said cutting edges at a tangential speed about said axis and rotating said annular surface of said wheel at said tangential speed, said drive means including a motor output and means for positively coupling said motor output to said first drive shaft and said second drive shaft.

5,003,856

PAPER CUTTER

Yasuo Fujimura, Sendai, and Toshio Fujiwara, Kashiwa, both of Japan, assignors to Sumitsu & Company, Limited, Japan

Filed Oct. 2, 1989, Ser. No. 415,611
Claims priority, application Japan, Jul. 7, 1989, 1-175946
Int. Cl.[5] B26D *5/08*
U.S. Cl. 83—576 3 Claims



1. A compact ,high-speed reciprocating paper cutter comprising:

a non-magnetic housing having an elongated linear opening in one side wall thereof and a series of permanent magnets mounted within the housing adjacent the opening, said permanent magnets having lines of flux being perpendicular to the opening and having poles of adjacent magnets being reversed,

a driving head slidably mounted within the housing for reciprocal movement parallel to said opening,

a coil set mounted in said driving head having three individual coils mounted in side-by-side relationship adjacent said magnets, said set covering four magnets in the series, each coil having a current flowing in a controllable direction,

sensor means associated with each coil in the set for sensing when the coil is centered between two adjacent magnets,

control means responsive to said sensor means for reversing the direction of current flow through each coil when the coil is centered between two adjacent magnets whereby the driving head is moved at high speed linearly along said opening,

a stationary blade secured to the housing having a linear cutting edge extending along the length of the opening, with said cutting edge being angularly offset in relation to said opening, and

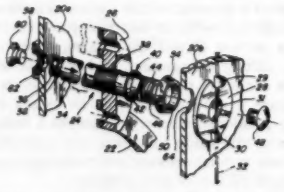
a movable blade connected through said opening to the driving head having a flat face that rides in contact against the cutting edge of the stationary blade so that a line of contact between said movable blade and said cutting edge moves up and down across the face of the movable blade as the driving head is moved linearly back and forth along said opening.

5,003,857

SPINDLE FOR HARP

Walter Krasicki, Sr., Niles, and Walter Krasicki, Jr., Park Ridge, both of Ill., assignors to W & W Musical Instrument Company, Chicago, Ill.

Continuation-in-part of Ser. No. 716,126, Mar. 22, 1985, Pat. No. 4,384,996. This application Apr. 13, 1989, Ser. No. 337,485
Int. Cl.[5] G10D *1/04*
U.S. Cl. 84—266 3 Claims



1. In combination with a harp having a base and a neck, a plurality of linkage assemblies secured by spindles between a pair of action plates secured to the neck, a disc secured to each of the spindles and rotatably operated by the spindles to grab a string associated with the disc, and a plurality of foot pedal assemblies supported within the base and coupled respectively with one of the plurality of linkage assemblies for operating them to rotate the spindles and the discs secured thereto, the improvement comprising a spindle for securing the linkage assemblies between the action plates comprising;

a cylindrical body portion having a reduced diameter shaft on one end thereof proportioned to extend into a bore in one of said pair of action plates and to be rotatably retained therein by means of a threaded screw means;

a keeper plate integrally formed with said cylindrical body portion and extending annularly about its peripheral surface to form a stop for said sleeve;

said keeper plate having a chamfered surface;

a sleeve formed of a material having a low coefficient of friction snug-fitted onto said cylindrical body portion and abutting said keeper plate, said sleeve having a chamfered inner surface to matingly engage with the chamfered surface of said keeper plate, and a chamfered outer peripheral surface which corresponds with a chamfered bore

formed in the other one of said pair of action plates and into which said sleeve seats;

said sleeve being rotatable relative to said keeper plate formed on said cylindrical body, and being further rotatable relative to said cylindrical body, and being further rotatable relative to said chamfered bore formed on one of said pair of action plates and into which said sleeve seats;

an exteriorly threaded portion on said cylindrical body portion at said other end thereof, said threaded portion being of a reduced diameter to freely extend through said chamfered bore in said other one of said pair of action plates for threadedly receiving a disc thereon;

a threaded bore and said exteriorly threaded portion for receiving therein a threaded disc screw for locking said disc to said spindle;

whereby said keeper plate formed on said cylindrical body portion and spindle freely rotates relative to said sleeve, and said sleeve rotatably moves relative to the bore formed in one of said action plates thereby to minimize the friction normally existing between the spindle and the other end of said pair of action plates.

5,003,858

PORTABLE RESONATING PLATFORM AND T-BAR FOR SECURING THE ENDPIN AND ENHANCING THE TONE OF A CELLO

Frances E. Rowell, P.O. Box 185, Limeport, Pa. 18060

Filed Nov. 15, 1989, Ser. No. 437,362
Int. Cl.[5] G10D *3/02*
U.S. Cl. 84—280 **8 Claims**

1. A portable resonating platform for enhancing the tone of a cello comprising:

a lower spruce plate;

an upper maple plate having an elongated narrow groove extending transversely along its upper surface, the groove being adapted to receive the endpin of a cello in any position along its length;

means for rigidly joining the upper and lower plates together in spaced-apart relation; and

means for preventing the plates from sliding when positioned on a surface.

5,003,859

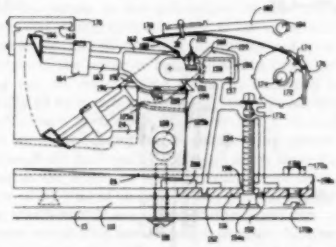
PERCUSSIVE ACTION MODULAR ELECTRONIC KEYBOARD

Charles Monte, 8519 Woodley Ave., Sepulueda, Calif. 91343; Paul J. White, and Anne C. Graham, both of Los Angeles, Calif., assignors to Charles Monte, Van Nuys, Calif.

Filed Feb. 16, 1989, Ser. No. 311,601
Int. Cl.[5] G10C *3/12*
U.S. Cl. 84—423 R **9 Claims**

9. An improved percussive action keyboard for play as a musical instrument of the type having pivoted playing keys having camming surfaces distal from finger contact surfaces thereof, pivoted hammers having cam follower surfaces for following the playing key camming surfaces, hammer stop means for stopping the swing of the hammer in response to depression of its associated key, an improved hammer comprising:

a hammer shank having a top rail with hammer weight holding and positioning means, a hammer head positioned at a free end of the hammer for engagement with the



hammer stop means, a hammer journal end with means for mounting the hammer on a flange for pivoted action; and

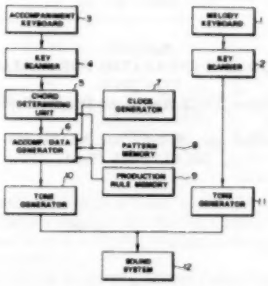
a user adjustable hammer weight having engagement means for engaging said hammer weight holding and positioning means at a position selectable by the user thereby to set the weight of the hammer.

5,003,860

AUTOMATIC ACCOMPANIMENT APPARATUS

Junichi Minamitaka, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 290,295
Claims priority, application Japan, Dec. 28, 1987, 62-333595
Int. Cl.[5] G01H *7/00, 1/38, 1/28*
U.S. Cl. 84—609 **14 Claims**



1. An apparatus for automatically providing an accompanimental line formed by a succession of harmonic and nonharmonic tones in response to chords supplied from a musical performance input means, comprising:

key determining means for automatically and variably determining a key in a current chord interval as a function of a series of supplied chords from said musical performance input means;

arpeggio line forming means for producing a line of harmonic tones in a current chord interval using members of a current chord supplied from said musical performance input means; and

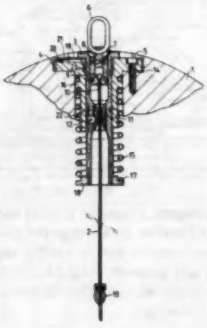
nonharmonic tone adding means for selecting nonharmonic tones from a scale of the determined key from said key determining means and for adding the selected nonharmonic tones to said line of harmonic tones.

5,003,861

SAFETY DEVICE FOR RELEASABLE CHARGES

Gérard Joset, Roissy En Brie, France, assignor to Thomson-Brandt Armements, Boulogne Billancourt, France

Filed Jan. 8, 1990, Ser. No. 461,819
Claims priority, application France, Jan. 20, 1989, 89 00684
Int. Cl.[5] B64D 1/04
U.S. Cl. 89—1.55 12 Claims



12. A safety device for preventing a cable from activating a releasable charge before the releasable charge has been released from a carrier on which the charge is carried, said safety device comprising:

a stop device engageable with the cable so as to transfer translational movement from the cable to the stop device;

a presence sensor engageable with said stop device by a releasable key such that said presence sensor translates with said stop device when said releasable key is engaged with the presence sensor; and

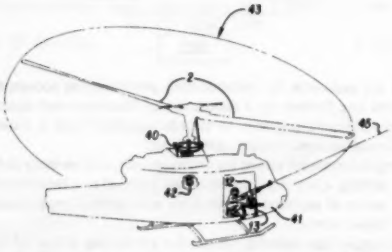
a releasing means for releasing the presence sensor from translating with the stop device when said presence sensor has translated to a predetermined position within the safety device.

5,003,862

METHOD AND APPARATUS FOR ARMAMENT CONTROL

Mark L. Stromire, 12532 Woodstock Dr., E., Upper Marlboro, Md. 20772

Filed Apr. 28, 1989, Ser. No. 344,958
Int. Cl.[5] F41A 19/05
U.S. Cl. 89—133 7 Claims



1. A control apparatus for synchronous operation of an armament and a plurality of blades rotating in an arcuate path comprising;

a drive shaft to which said blades are fixedly attached providing for the rotation of said blades in a substantially horizontal plane vertically disposed above said armament;

stationary means adjacent to said shaft;

rotating means fixedly attached to said shaft and cooperating with said stationary means;

a mount providing for secure retention of said armament;

said mount having elevational means and also traversal means;

rotor blade position means for providing a determination of position of said blades, said rotor blade position means includes a plurality of coils on said stationary means and plurality of magnets on said rotating means, said rotor blade position means receives a signal generated in said coils by said magnets and said generated signal indicates position of said blades in said arcuate path;

armament aim means providing for an indication of aim of said armament, said indication of aim including both vertical elevation and horizontal traversal; and

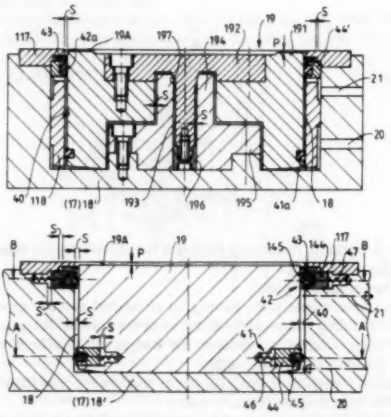
control means receiving said determination of position and said indication of aim to provide synchronous operation of said armament and said rotating blades.

5,003,863

CYLINDER-PISTON UNIT FOR DISPLACING A ROLL AT RIGHT ANGLES TO ITS LONGITUDINAL AXIS

Christian Schiel, and Paul Hafner, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Filed May 1, 1989, Ser. No. 345,437
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1988, 3814754
Int. Cl.[5] F01B 1/02
U.S. Cl. 92—61 10 Claims



1. In a cylinder-piston unit for displacing a bearing housing for a rotatable roll at right angles to the longitudinal axis thereof, the displaceable bearing housing is arranged in a stationary frame accommodating said piston-cylinder unit and is guided therein by means of linear guide-elements extending in the direction of displacement, the improvement wherein:

(a) the stationary frame comprises a cylinder-bore, the axis of which runs in the direction of displacement, and which contains an axially-mobile piston, the outer end-face of which engages with the bearing housing;

(b) the diameter of the cylinder-bore is greater than the diameter of the piston, thus providing, between the cylinder-bore and the piston, an annular gap in which resilient sealing rings are arranged;

(c) the difference between the diameters of the cylinder-bore and that of the piston is greater than the greatest possible amount of play of the linear guide-elements at right angles to the direction of displacement of the bearing housing;

(d) the axial length of the piston is less than the depth of the cylinder-bore; and

(e) a centering device engages with the piston in such manner that, in the unloaded condition of the cylinder-piston unit, said piston is centered in the cylinder-bore.

5,003,864

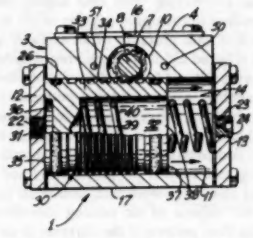
GEARED AIR ACTUATOR

John Dyer, Cresskill, N.J., assignor to Hoke Incorporated, Cresskill, N.J.

Filed Dec. 28, 1989, Ser. No. 458,434

Int. Cl.[5] F01B *31/00, 9/00*

U.S. Cl. 92—132 **5 Claims**



1. A geared air actuator comprising a housing, a piston mounted for movement in said housing, said housing having a front end wall and a rear end wall, said piston having a front wall and a hollow body portion extending rearwardly therefrom, the front wall and the hollow body of the piston being located between said housing front and rear end walls, spring means mounted within the hollow body portion of said piston, means for introducing pneumatic fluid into the housing between said housing front end wall and said piston front wall to bear against the piston front wall and move the piston against the action of the spring means, whereby the spring will move the piston back to its original position upon termination of the introduction of pneumatic fluid into the housing, the front wall of the piston being substantially thinner than the length of the body portion of the piston, the said front wall and the body portion being non-rotationally mounted to each other, a gear thread circumventing a substantial portion of the circumferential outer surface of the body portion, said gear thread being located wholly between the housing front and rear end walls, a pinion rack at right angles to and meshing with the gear thread, said spring means being interposed between the inner surface of the front wall of the piston and the rear end wall of the housing.

5,003,865

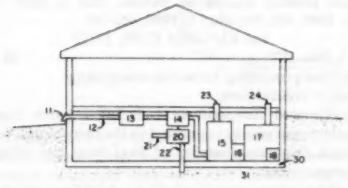
PRESSURE CONTROLLED FRESH AIR SUPPLY VENTILATION SYSTEM SOIL GAS PRESSURE AS A REFERENCE, AND METHOD OF USE

Jon E. Traudt, 3316 Augsta, Omaha, Nebr. 68144

Filed Dec. 27, 1989, Ser. No. 457,406

Int. Cl.[5] F24F *11/04*

U.S. Cl. 98—1.5 **5 Claims**



1. A ventilation system for use in a house or building, which house or building sets upon a foundation atop of underlying soil and is equipped with a heating and air conditioning system comprised of a cold air return, a blower fan and a high efficiency particulate filter; which ventilation system comprises, in combination with the heating and air conditioning system, a series combination of a prefilter and an inlet air blower, which prefilter and inlet air blower are attached to one another by way of a common duct, which common duct, at one end thereof, has access to the atmosphere outside the house or building, and which common duct, at the other end thereof, attaches to the cold air return of the heating and air conditioning system of the house or building; which house or building heating and air conditioning system is fashioned such that essentially all air entering the cold air return passes through the high efficiency particulate filter and and is caused by the blower fan of the heating and air conditioning system to circulate through the house or building and either leave through an opening in the house or building, such as an open door or window or by way of an exhaust fan, or return to the cold air return; which ventilation system further comprises a pressure difference monitoring sensor, which pressure difference monitoring sensor monitors the air pressure inside the house or building and also monitors soil gas pressure beneath the foundation of the house or building without significantly altering said soil gas pressure; which pressure difference monitoring sensor produces a signal which is proportional to the difference between the two identified pressures, which signal is used to regulate the operation of the inlet air blower so as to increase air volume flow rate when the air pressure in the house or building is at a level, when compared to the soil gas pressure, lower than a user selected level, so that the air pressure inside the house or building is increased, and to again operate at a reduced air volume flow rate when the air pressure inside the house or building is at, or above, the user selected level with respect to the soil gas pressure.

5,003,866

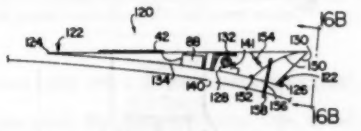
CAR VENTILATOR

Russell L. Ricci, 225 Kitemaug Rd., Uncasville, Conn. 06382

Division of Ser. No. 326,921, Mar. 22, 1989, abandoned. This application Mar. 29, 1990, Ser. No. 501,954

Int. Cl.[5] B60H *1/26*

U.S. Cl. 98—2.02 **4 Claims**



1. In combination with a motor vehicle having a substantially horizontally disposed roof having a generally streamline contour enclosing a vehicular interior environment from an exterior environment:

said roof having an opening formed therein for allowing air to communicate between said interior and said exterior environments;

a scoop-type ventilator supported on said roof and positioned in coincidence with said opening in said roof for moving air between the vehicle interior and exterior environments;

said scoop-type ventilator being comprised of a housing having a leading edge and a rearwardly oriented trailing edge;

extending rearwardly from said leading edge to said trailing edge are two spaced apart side walls oriented substantially vertically and parallel to one another;

said side walls increasing in height proceeding away from said leading edge towards said housing trailing edge;

a top cover member having a substantially planar surface defining the leading edge of said ventilator, each of said side walls being connected to said cover member along

the top edge of each side wall such that said cover member extends substantially horizontally and generally within the same plane as that of the generally streamline contour of said roof;

a base member extending between each of said side walls and being connected at the opposite lower edges of each of said side walls such that said base member gradually slopes downwardly proceeding the way from the housing leading edge toward the housing trailing edge;

said top cover member and each of said side walls and said base member together defining a first opening in said housing adjacent said housing trailing edge;

a second opening formed in said base member and being placed in communication with said opening formed in said roof permitting air to move between said interior environment of said vehicle through said first and second openings and said exterior environment;

a damper disposed adjacent said trailing edge of said ventilator and oriented generally transversely to each of said side walls and being sized such that said damper in a closed position generally blocks the passage of air through said first opening; and

powered impeller means located within said ventilator for positively moving air through said ventilator between said interior and exterior environments.

5,003,867

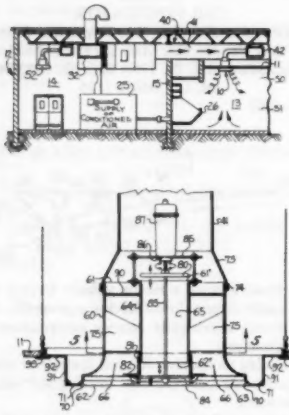
AIR CONDITIONING SYSTEM FOR GROCERY STORE OR THE LIKE AND DIFFUSER UNITS THEREOF

Franc Sodec, Wurselen, Fed. Rep. of Germany; Donald L. Hudson, Matthews, and David T. Bolen, Charlotte, both of N.C., assignors to Hudson Associates, Inc., Charlotte, N.C.

Filed Jun. 2, 1989, Ser. No. 360,406

Int. Cl.[5] **F24F** *13/062, 7/08*

U.S. Cl. 98—31.6 **27 Claims**



11. A grocery store or the like having refrigerated food displays or the like along certain aisles of the store and having a ceiling which is typically of a height of 12 feet or more, the combination therewith of an air conditioning system characterized in that only a single air return conduit is required for properly accommodating the entire store due to the enhanced mixing of the air within the store and the elimination of stagnant air areas, particularly heavy, cool stagnant air heretofore typically present and lying adjacent refrigerated food displays, said air conditioning system including means providing a supply of conditioned air, overhead air supply conduits located above the ceiling and connected to said supply of conditioned air for supplying conditioned air into the store, a single air return conduit for returning air from the store to said supply means for conditioned air, air outlet diffuser units mounted in said ceiling of the store at predetermined locations and connected to said air supply conduits for receiving conditioned air therefrom and for providing a downward flow of conditioned air into the store, a plurality of said air outlet diffuser units being positioned substantially above the aisles adjacent said refrigerated food displays and each being so constructed as to provide a downward flow of conditioned air into the store in such a manner that the shoppers moving about the aisles therebelow receive conditioned air substantially free of drafts for aiding in shopper comfort, while heavy, cool, stagnant air lying adjacent said refrigerated food displays and the like is induced upwardly into upper regions of the store above the shoppers for effecting mixing thereof in the upper regions of the store with the conditioned air flowing from the diffuser units and also for mixing with that higher temperature air inherently residing in the upper regions of the store above the shoppers, each of said plurality of air diffuser units having a housing with a flared air exit mouth, means defining a tubular air passageway positioned coaxially of said housing and also defining an annular air passageway between itself and said housing, a plurality of vanes mounted in said annular passageway for producing rotational, highly turbulent currents of air flowing from said passageway, said vanes interconnecting said means defining said tubular air passageway and said housing, control means associated with said tubular air passageway for controlling the volume of air passing therethrough and for controlling the flow pattern of the currents of air flowing from said annular air passageway so that as the volume of air passing through said tubular air passageway is increased, the flow pattern of the currents of air flowing from said annular passageway is directed downwardly in a more vertical direction and in a more compact flow pattern and over a smaller area of the store, the upper end of said tubular air passageway and the upper end of said annular passageway each being in fluid communication with one of said overhead supply conduits for receiving conditioned air therefrom, means defining a perforated air diffuser mounted in said housing adjacent the ingress end of said annular passageway and in surrounding relation to said tubular air passageway for diffusing the airflow from said supply conduit into said annular passageway for obtaining a more uniform flow of air to said vanes mounted therein, said perforated air diffuser also serving for apportioning the amount of airflow from said conduit into said annular passageway, both the flared exit mouth of said housing and the lower end of said annular passageway extending below said store ceiling a predetermined distance so as to position the outflow of air from said tubular passageway and the outflow of air from said annular passageway at a predetermined distance below said ceiling so as to avoid air flowing from said annular passageway outwardly along the face of said ceiling and creating an undesirable coanda effect, and mounting means surrounding said housing and serving for individually mounting each of said plurality of air diffuser units in the ceiling of the store.

5,003,868

FOOD PROCESSING APPARATUS

John Higgins, Ennis, and Michael McDonagh, Cratloe, both of Ireland, assignors to Alperk Limited, Shannon, Ireland

Filed Apr. 26, 1990, Ser. No. 513,499

Claims priority, application Ireland, May 1, 1989, 650/89; May 1, 1989, 652/89; May 1, 1989, 653/89

Int. Cl.[5] **A47J** *37/00, 37/12*

U.S. Cl. 99—357 **10 Claims**

1. A food processing apparatus comprising:

a central control unit;

a refrigerated compartment including a batch dispensing system operatively connected to the control unit for automatic dispensing batches of food from the refrigerated compartment;

a cooking compartment including a deep-fry cooking chamber comprising:

a casing;

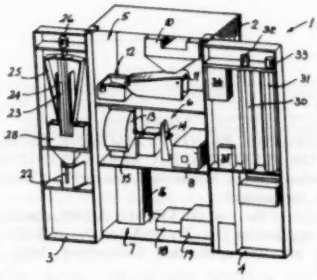
an oil heating means;

a reception opening in the casing for reception of batches of frozen food from the refrigerated compartment;

door means operated by a drive means operatively connected to the control unit for covering the reception opening except when a batch of food is being received;

a food basket mounted in the casing;

drive means for moving the basket between a cooking position in which at least portion of the basket is immersed in oil for cooking and a discharge position for



delivery of food from the basket through a discharge outlet in the casing;

barrier means for the discharge outlet in the casing, the barrier means being movable from a closed position for substantially sealing the casing discharge outlet during cooking and an open position to allow discharge of food from the basket through the casing discharge outlet when the basket is in the discharge position; and

a container dispensing mechanism operatively connected to the control unit for automatically dispensing a container for reception of the discharged cooked food.

5,003,869

PROCEDURE FOR THE METERED ADDITION OF COPPER IONS IN CHEESE PRODUCTION

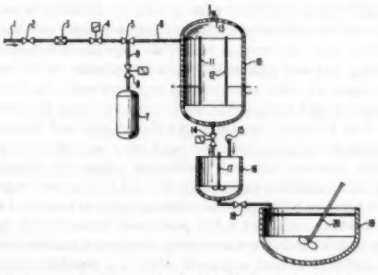
Claus Fabricus, Alleröd, Denmark, assignor to Mator AG, Inwil, Switzerland

Division of Ser. No. 365,548, Jun. 13, 1989. This application Aug. 31, 1990, Ser. No. 575,647

Claims priority, application Switzerland, Jun. 14, 1988, 2277/88

Int. Cl.[5] **A23C** *19/00, 19/05, 19/068;* **A01J** *25/00*

U.S. Cl. 99—453 **1 Claim**



1. An apparatus for producing hard cheese using a process which comprises treating raw milk in a stainless steel kettle in the presence of copper ions, enzymes necessary for cheese production and added water to dissolve the enzymes, said apparatus comprising:

(a) an electrolyzing tank having a vent and a means for introducing copper ions into added water comprising an anode and a cathode,

(b) means for feeding added water into the electrolyzing tank,

(c) means for adding a metered amount CO_2 to the added water,

(d) a mixing tank having a mixing device,

(e) means for draining the added water from the electorlyzing tank into the mixing tank,

(f) means for adding enzyme to the mixing tank,

(g) a milk kettle having a mixing device, and

(h) means for draining the added water from the mixing tank into the milk kettle.

5,003,870

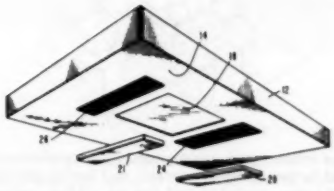
ANTISTRETCH SCREEN PRINTING ARRANGEMENT

Harlan Isaak, Costa Mesa, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 21, 1989, Ser. No. 396,173

Int. Cl.[5] **B05C** *17/06*

U.S. Cl. 101—127.1 **17 Claims**



1. A screen printing apparatus, comprising:

frame means;

a screen mesh attached to said frame means, said screen mesh being coated with a photosensitive emulsion and having a predefined pattern area therein formed by removal of portions of said emulsion for screen printing, said screen mesh having an inner screen surface and an outer screen surface, and

two flat elongated strips attached to said outer screen surface and located a short distance outside the pattern area and spaced inwardly from said frame means.

5,003,871

INKING UNIT FOR A ROTARY OFFSET PRINTING MACHINE

Karl-Heinz Franz, Aschaffenburg; Heinrich Ochs, Sinntal, and Kurt Difflipp, Dietzenbach/Steinberg, all of Fed. Rep. of Germany, assignors to Man Roland Druckmaschinen AG, Fed. Rep. of Germany

Continuation of Ser. No. 160,590, Feb. 26, 1988, abandoned. This application Jun. 8, 1990, Ser. No. 535,995

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1987, 3706602

Int. Cl.[5] **B41F** *7/26, 7/36, 31/10*

U.S. Cl. 101—148 **8 Claims**

1. An inking unit for a rotary offset printing machine having a plate cylinder, a damping system and an ink supply system including a plurality of ink transport rolls for delivering ink to a plurality of inking rolls engaging the plate cylinder comprising, in combination,

one of said ink transport rolls being a primary ink distributor roll,

said inking rolls including a front roll pair including a primary ink applicator roll and a secondary ink applicator roll,

means including a first branch roll for conveying ink from said primary ink distributor roll to said primary and secondary ink applicator rolls,

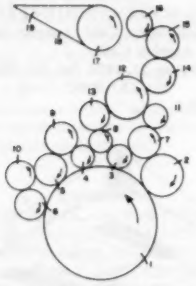
means including a second branch roll for also conveying ink

from said primary ink distributor roll to said primary ink applicator roll,

said first and second branch rolls being disposed respectively in first and second roll trains to define first and second parallel subflow paths of ink conveyed from said primary ink distributor roll to said primary ink applicator roll, said first and second roll trains each having adjacent rolls,

said secondary ink applicator roll being coupled to said first roll train and disposed to engage the plate cylinder after the engagement of said primary ink applicator roll with the plate cylinder,

said inking rolls including at least one further ink applicator roll engaging the plate cylinder after the engagement of said secondary ink applicator roll with the plate cylinder,



a rider roller engaging said secondary ink applicator roll and said further ink applicator roll, said further ink applicator roll being coupled to said first ink subflow path only by said rider roller,

means for enabling at least one of said branch rolls for selective engagement with and disengagement from at least one of the adjacent rolls in the respective one of said first and second roll trains,

and said damping system including means for conveying damping fluid to the plate cylinder in advance of the engagement of said primary ink applicator roll with the plate cylinder, such that increases in the amount of damping fluid conveyed to the plate cylinder automatically decrease the flow of ink in said second subflow path relative to the flow of ink in said first subflow path.

5,003,872

DEVICE FOR APPLYING COLOR TO A BLOCK OF A TAMPON PRINTING MACHINE

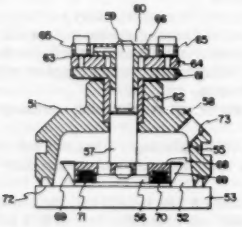
G. Robert Dalferth, Ludwigsburg, Fed. Rep. of Germany, assignor to Morlock Mechanik GmbH

Filed Jun. 23, 1989, Ser. No. 370,462

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1988, 8808059[U]; July 27, 1988, 8809564[U]

Int. Cl.[5] B41F *31/00*

U.S. Cl. 101—163 **21 Claims**



1. In a device for applying color to a block of a tampon printing machine comprising a coloring and wiping device which includes a bottomless hollow body (**51**), the hollow body (**51**) having an open side, the hollow body (**51**) adapted to be movable relative to the block and to be placed with the open side on the block and pressable against the block by means of a pressing device, the improvement comprising a stirring mechanism (**56**) being rotatably arranged in the hollow body (**51**), the pressing device comprising at least one magnet, the stirring mechanism (**56**) having at least one downwardly open chamber (**70**), the at least one magnet being mounted in the downwardly open chamber.

5,003,873

FLEXOGRAPHIC PRINTING MACHINE, ESPECIALLY FOR FLEXOGRAPHIC BLANK PRINTING

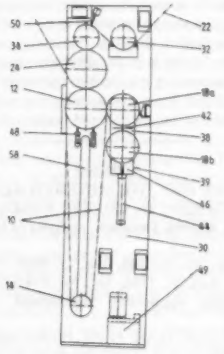
Peter Lauber, Stetten, Switzerland, assignor to Conprinta Ltd., Zurich, Switzerland

Continuation of Ser. No. 189,537, May 3, 1988, abandoned. This application Oct. 27, 1989, Ser. No. 428,050

Claims priority, application Switzerland, May 7, 1989, 01741/87

Int. Cl.[5] B41F *5/04, 31/30*

U.S. Cl. 101—219 **8 Claims**



1. A printing machine for flexographic web printing comprises at least one printing unit, each of said at least one printing unit being provided with a back-up cylinder, a tension roller and an endless printing belt drawn around said back-up cylinder and said tension roller, an impression cylinder for pressing said web against said back-up cylinder, an ink bath, a first engraved roller and a second engraved roller for transferring ink to said endless printing belt, drive means for drawing said web between said back-up cylinder and said impression cylinder for printing said web with ink transferred from said endless printing belt and positioning means for selectively positioning said first engraved roller and said second engraved roller between a first position wherein said first engraved roller is a working engraved roller positioned so as to pick up ink from said ink bath for transferring ink to said endless printing belt and said second engraved roller is a stand-by engraved roller and a second position wherein said second engraved roller assumes the position of said first engraved roller when in said first position and is the working engraved roller for picking up ink from said ink bath for transferring ink to said endless printing belt and said first engraved roller assumes the position of said second engraved roller when in said first position.

5,003,874

DISTRIBUTOR ROLLER FOR AN INKING UNIT OF A PRINTING PRESS

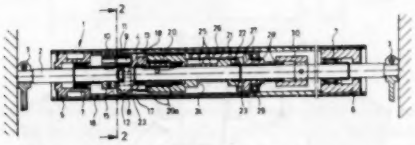
Rudi Junghans, Wilhelmsfeld, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen, Heidelberg, Fed. Rep. of Germany

Filed Dec. 4, 1989, Ser. No. 445,481

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1988, 3840871

Int. Cl.[5] **B41F** *31/14, 31/26;* **B41L** *27/16*

U.S. Cl. 101—348 **20 Claims**



1. A distributor roller for use in a printing press, said distributor roller comprising:

an axial shaft member, said axial shaft member having a longitudinal axis;

a casing member substantially encircling said axial shaft member, said casing member being rotatably and axially slideably mounted for rotation about and for axial translation with respect to said axial shaft member;

said casing member having an interior surface substantially surrounding said axial shaft member, said interior surface of said axial shaft member having a cross-section which, when taken substantially transverse to said axial shaft member, is eccentrically disposed with respect to said shaft member;

means for rotating said casing member about said axial shaft member;

an oscillating body member disposed within said casing member, said oscillating body member being pivotally mounted for pivotal movement in a direction substantially transverse to the longitudinal axis of said axial shaft member;

said oscillating body member having at least one engagement surface for engaging said eccentrically disposed interior surface of said casing member;

whereby said oscillating body member is caused to undergo a reciprocating movement in the direction substantially transverse to the longitudinal axis of said axial shaft member upon rotation of said casing member about said axial shaft member; and

conversion means for converting said reciprocating movement of said oscillating body member into a reciprocating axial displacement of said casing member with respect to said axial shaft member.

5,003,875

FOUNTAIN ROLL AND ASSEMBLY FOR CAN DECORATING APPARATUS

Frank L. Shriver, Lakewood, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Mar. 13, 1989, Ser. No. 322,514

Int. Cl.[5] **B41F** *31/04, 31/06*

U.S. Cl. 101—350 **18 Claims**

1. A fountain roll and assembly for a can decorating apparatus comprising:

a pair of spaced apart fixedly mounted frame members;

pan means for holding a supply of ink;

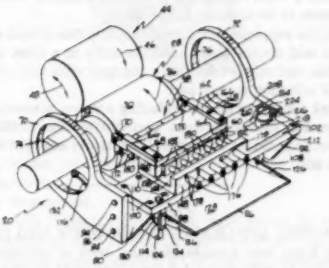
adjustable support means for adjustably supporting said pan means on said frame members so as to maintain the level of said supply of ink in a plane substantially parallel to the horizontal;

a fountain roll having a generally cylindrical outer peripheral surface for contacting said supply of ink;

mounting means for mounting said fountain roll for rotation about a fixed axis and located so that the lower portion of said outer peripheral surface of said fountain roll as it rotates is immersed in said supply of ink so as to provide a coating of ink on said outer surface;

mounting means for rotating said fountain roll so that said outer peripheral surface is moving upwardly when it leaves said supply of ink;

doctor blade means for contacting said coating of ink on said outer peripheral surface of said fountain roll after it leaves said supply of ink to remove excess ink from said outer peripheral surface and to leave an even layer of ink on said outer peripheral surface;



means for supporting said doctor blade means for movement in at least one linear direction and also in another linear direction perpendicular to said one linear direction;

adjusting means for moving said doctor blade means at least in one linear direction and also in another linear direction perpendicular to said one linear direction;

said pan means having a horizontal cross-sectional configuration that is substantially larger than the horizontal cross-sectional configuration of said fountain roll and said doctor blade means so that all of said removed excess ink falls back into said pan means; and

a rotatable and oscillatory ductor roll mounted so that it can be moved into and out of contact with said layer of ink on said outer peripheral surface.

5,003,876

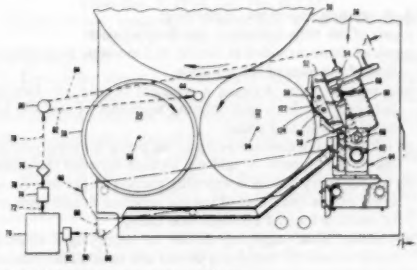
PRINTING APPARATUS WITH DUAL INKING SYSTEM

John R. Harrison, Baltimore, and Michael W. Millard, Baldwin, both of Md., assignors to The Ward Machinery Company, Cockeysville, Md.

Filed Feb. 10, 1989, Ser. No. 310,065

Int. Cl.[5] **B41F** *31/04, 31/06, 31/08;* **B41L** *27/10*

U.S. Cl. 101—350 **21 Claims**



1. Printing apparatus, comprising:

a frame structure;

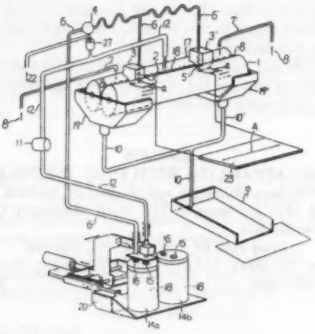
a print cylinder rotatably mounted in said frame structure:
an ink roll rotatably mounted in said frame structure and engageable with said print cylinder for transferring ink thereto;
a wipe roll rotatably mounted in said frame structure;
means for moving said wipe roll into and out of engagement with said ink roll;
a doctor blade head assembly;
means for moving said doctor blade head assembly into and out of engagement with said ink roll;
selection means for actuating said wipe roll moving means and said doctor blade head assembly moving means for selectively engaging either of said wipe roll and said doctor blade head assembly with said ink roll and spacing the other of said wipe roll and said doctor blade head assembly from and out of contact with said ink roll to enable either a wipe roll inking system or a doctor blade inking system to be selected for printing;
means for supplying ink directly to only one of said wipe roll and said doctor blade head assembly at a time, and only while said one is selectively engaged with said ink roll by said selection means; and
said ink supplying means including a valve, actuated by said selection means between two distribution positions, for directing said ink to said one selectively engaged with said ink roll.

5,003,877

PRINTING APPARATUS INKER WITH END DAMS

Tadashi Yano, and Kenichi Hamada, both of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 17, 1989, Ser. No. 338,318
Claims priority, application Japan, Apr. 18, 1988, 63-50851[U]
Int. Cl.[5] B41F *31/20, 35/04*; B41L *27/22, 41/04*
U.S. Cl. 101—363 **3 Claims**



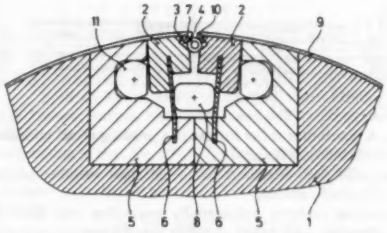
1. A printing apparatus comprising:
a pair of ink rolls defining a nip therebetween;
a pair of dams provided in the nip and movable in the direction of the axes of the ink rolls;
said pair of dams defining a segment of said nip located between the dams and defining segments of said nip located outside said dams;
an ink supplying device having an ink pump for supplying an ink to the segment of said nip located between the dams;
an ink recovery device comprising suction means for recovering excess quantities of the ink supplied to said segment of said nip located between said dams;
a washing liquid supplying device for supplying a washing liquid to said ink supplying device and to said ink recovering device via said nip; and
a lubricant supplying device for supplying a lubricating liquid to the segments of said nip located outside said dams.

5,003,878

APPARATUS FOR CLAMPING PRINTING PLATES

Joachim Dorow, Hassloch, and Gerhard Bleckmann, Lampertheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 12, 1988, Ser. No. 142,997
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1987, 3702032
Int. Cl.[5] B41F *13/08, 27/06*
U.S. Cl. 101—415.1 **1 Claim**



1. Apparatus for clamping printing plates for printing presses comprising two clamping strips which are displaceably arranged in a cylinder recess and held by two leaf springs and hook under an end region of the printing plate to be clamped and whose outer contours, in the clamped state, have a curvature corresponding to the cylinder curvature and each of which is bonded by an inner surface terminating at the top in a thrust surface which engages a bent-over edge claw of the printing plate to be clamped,
wherein two cams are rotatably mounted in said recess outwardly of said clamping strips, which cams, upon rotation, displace said clamping strips, respectively, in the clamping direction of the printing plate;
wherein a third cam is rotatably mounted between the leaf springs and in the vertical plane of symmetry of the apparatus, said third cam, upon rotation, engaging said springs in the unclamping direction of the printing plate to displace said clamping strips in the last-mentioned direction; and
wherein a resilient hose filled with a sealing compound and having at least one orifice along its length facing the printing plate to be clamped is inserted between said clamping strips in the region below said thrust surfaces, said inner surfaces of the clamping strips being formed so that as the clamping strips are displaced toward the clamped state under the control of the first-mentioned two cams, said resilient hose is deformed by said clamping strips to force the sealing compound through said orifice out of said hose and toward said end region of the printing plate.

5,003,879

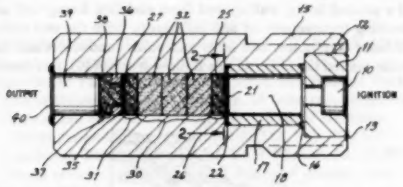
DELAY DETONATOR

Ronald G. Jones, Godfrey, Ill., assignor to Propellex, Edwardsville, Ill.

Filed Nov. 6, 1989, Ser. No. 432,079
Int. Cl.[5] F42C *19/10*
U.S. Cl. 102—204 **6 Claims**

1. A delay detonator for causing output device detonation a predetermined delay period of time following ignition of the detonator, comprising: a metal body, a primer fitted at an inner end of the body, a recess opening from the primer into an expansion chamber, a first-fire combustion section including first-fire ignition powder separated from the expansion chamber by a retention screen, a delay column proximate the first-

fire combustion section including a delay powder composition to be ignited by the ignition powder, the delay column being of a relatively high length/diameter aspect ratio, a further combustion section including first-fire ignition powder for ignition by the delay column after a delay burn time thereof, and a detonator output assembly at an opposite, outer end of the body for ignition by the further combustion section; the delay



column having a burn time which accounts substantially entirely for said predetermined delay period, being cylindrical in form and of constant diameter, and of a length/diameter aspect ratio of approximately 3:1, containing a tungsten delay composition, and being assembled by three successive charges of delay composition of essentially equivalent weight, loaded at equivalent pressures.

5,003,880

PROCESS FOR THE IMPACT HEALING OF INNER DISCONTINUITIES OR DEFECTS IN THE SUB-SURFACE REGION OF A CAST COMPONENT

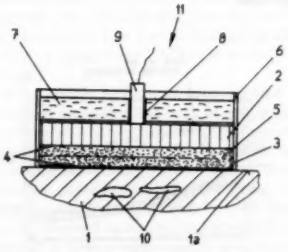
Karl Gut, Benken; Wolfgang A. Matejka, Uhwiesen; Walter Gysel, Schaffhausen, and Urs Gerber, Flurlingen, all of Switzerland, assignors to Georg Fischer AG, Schaffhausen, Switzerland

Filed Apr. 14, 1988, Ser. No. 181,563

Claims priority, application Switzerland, Apr. 14, 1987, 01437/87

Int. Cl.[5] **F42B** *3/00*

U.S. Cl. 102—314 **13 Claims**



1. A process for the impact healing of inner discontinuities present in sub-surface areas of a cast metal component comprising providing a cast metal component having inner discontinuities in sub-surface area thereof, locating an explosive charge on the surface of the cast metal component over the inner discontinuities and detonating said explosive charge whereby said inner discontinuities are substantially healed without destruction of the cast metal component.

5,003,881

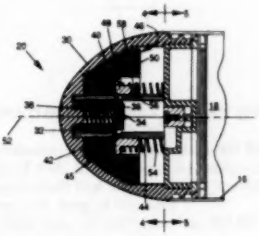
AERIAL FLARE AND IGNITER

Stanley J. Herold, Switz City; Charles D. Howard, Edwardsport, and Donald E. LaGrange, Washington, all of Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 7, 1990, Ser. No. 564,234

Int. Cl.[5] **F42B** *4/28;* **F42C** *15/24, 15/26*

U.S. Cl. 102—337 **8 Claims**



1. An igniter, comprising

actuating means for initiating ignition,

locking means for holding the actuating means from initiating ignition,

inertial mass means,

guide means mounting the inertial mass means for relative movement along a fore-and-aft axis between a safe position and an armed position aft of the safe position under launching forces,

the inertial mass means including setback means for holding the locking means in the safe position,

the inertial mass means also including weight means separable from the setback means for holding the locking means in the armed position,

means biasing the inertial mass means in the safe position,

the guide means including means for guiding the weight means for relative movement to an ignition position forward of the armed position upon application of forward motion retarding forces, and

retention means for restraining the setback means from movement to the ignition position with the weight means,

the weight means including means for releasing the locking means upon movement of the weight means to the ignition position,

thereby enabling the actuating means to initiate ignition.

5,003,882

DEVICE FOR TILTING A SUB-MUNITION UNDER A PARACHUTE INTO INCLINED POSITION

Jean-Pierre Frehaut, and Jean-Pierre Pineau, both of Orleans, France, assignors to Thomson-Brandt Armements, Boulogne Billancourt, France

Filed Jan. 9, 1990, Ser. No. 462,557

Claims priority, application France, Jan. 20, 1989, 89 00685

Int. Cl.[5] **F42B** *10/56, 12/10*

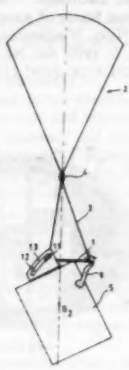
U.S. Cl. 102—387 **7 Claims**

1. Device for tilting a sub-munition under a parachute into an inclined position, comprising a plate intended to be carried under the said parachute, and including primary and secondary means of suspending the said sub-munition from the plate,

the primary means of suspension being formed of an arm with an upper and a lower end hinged to the plate and the sub-munition respectively, about horizontal parallel axes,

the secondary means of suspension having a structure with two positions: one position in which the sub-munition is vertical and another in which it is inclined, this structure also comprising a means for guiding the tilting from the vertical to the inclined position along a path such that the

center of gravity of the sub-munition moves downward along a vertical line during said tilting, a means of locking



it in the first position and a means of releasing it from the first position.

5,003,883

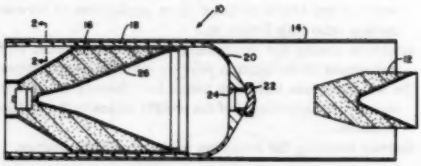
LIGHTWEIGHT BLAST SHIELD

Larry C. Mixon, Madison; George W. Snyder, Huntsville; Scott D. Hill, Toney; Gregory L. Johnson, Decatur; J. Frank Wlodarski; Alexis P. von Spakovsky, both of Huntsville; John D. Emerson, Arab; James M. Cole, and John P. Tipton, both of Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 23, 1990, Ser. No. 555,951

Int. Cl.[5] F42B *12/10*

U.S. Cl. 102—476 **10 Claims**



1. A tandem warhead missile assembly comprising, and elongated composite material housing of wound fiber and epoxy, first and second warheads mounted in said housing in spaced relationship, and a dome shaped composite material blast shield of wound fiber and epoxy, made integral with said housing, separating said first and second warheads and for protecting said second warhead from explosive blast of said first warhead.

5,003,884

HOLLOW OR PROJECTILE CHARGE

Norbert Nissl, and Peter Grössler, both of Schrobenhausen, Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung

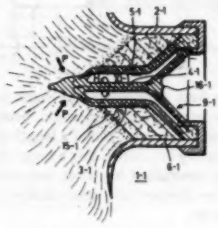
Filed May 24, 1984, Ser. No. 633,784

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1983, 3321035

Int. Cl.[5] F42B *12/10*

U.S. Cl. 102—476 **7 Claims**

1. Hollow or projectile charge comprising an explosive material charge, and a lining acted upon by the detonation of said explosive material charge and forming a spike or projectile, wherein the improvement comprises an axially extending inner conductor (4), an axially extending outer conductor (5) encircling and spaced radially outwardly from said inner conductor, said inner and outer conductors forming a coaxial system (3), said explosive material charge (6) laterally enclosing said outer conductor, said lining comprising a double-walled lining (9) at one end of said inner and outer conductors and comprising a first lining wall (9) extending transversely of and outwardly from the one end of said outer conductor with said first lining wall contacting said explosive material charge, and a second lining wall spaced from said first lining wall and extending transversely of and outwardly from the one end of said inner conductor, said inner and outer conductors and said double-walled lining forming a hollow spaced (10), said coaxial



system is electrically open at a location (12) spaced axially from said double-walled lining, electric feed means (8) in spaced relation to said inner and outer conductors at the electrically open location for feeding a high current pulse into said coaxial system so that an electromagnetic field is generated in said hollow space (10), an igniter (7) located in said explosive material charge in the region of the electrically open location (12) and the ignition thereof is initiated after feeding the high current pulse whereby the inner and outer conductors are pressed into contacts closing said hollow space (10), and the detonation of the explosive material charge continues to compress said hollow space until the spike is formed from said double-walled lining (9).

5,003,885

WARHEAD FOR AN AIRBORNE BODY

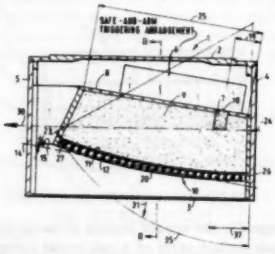
Karl Rudolf, Schrobenhausen, and Konrad Ringel, Leinburg, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Dec. 14, 1989, Ser. No. 451,116

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1988, 3843432

Int. Cl.[5] F42B *12/32*

U.S. Cl. 102—494 **8 Claims**



1. A warhead for an airborne body for the attacking of a lightly-armored target through the intermediary of splinters, said warhead including a protective enclosure, a safe-and-arm and triggering arrangement, an explosive charge and splinter-producing insert being arranged within said enclosure, said splinter-producing insert being slightly convexly outwardly

curved and located essentially within a single main plane, said main plane intersecting the longitudinal axis of the warhead at an angle of between about 5° to 30°, said insert, viewed in the direction of flight, having a bottom located below a transverse axis in the region of a rear wall of the warhead and continually rising in the direction of flight, and a triggering location for the explosive charge being in a longitudinal symmetrical axis of the charge proximate the rear wall of said warhead.

5,003,886

PROJECTILE FOR COMBATTING ACTIVELY AND PASSIVELY RECTING ARMOR

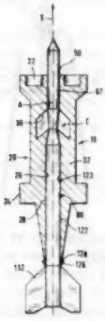
Klaus-Dieter Pahnke, Hilden; Rolf Holl, and Wilfried Becker, both of Düsseldorf, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 35,113, Mar. 18, 1987, abandoned. This application Jul. 29, 1987, Ser. No. 81,801

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1986, 3609092

Int. Cl.[5] **F42B** *14/06, 12/68*

U.S. Cl. 102—521 **6 Claims**



1. Sabot-projectile arrangement adapted for being ejected from a gun barrel for the purpose of combatting actively and passively reacting armor, the sabot-projectile arrangement comprising:

first and second projectiles, each having a different coefficient of air resistance (c_w);

a discarding sabot comprised of segments which are discarded after the sabot-projectile arrangement leaves a gun barrel, the segments of said sabot defining a receptacle for accommodating said first and second projectiles with their longitudinal axes flush behind one another in order to follow one another in a spaced relationship on a common trajectory, with said first projectile leading said second projectile;

form locking means defining a form locking connection between said receptacle and each of said projectiles, with said form locking connection existing between the leading first projectile disposed in said receptacle and the segments of said sabot being released earlier than when said segments are separated from said second projectile after said sabot-projectile arrangement leaves a gun barrel;

delay means, disposed on said second projectile, for delaying said second projectile with respect to said first projectile when said segments are being separated for creating a desired distance between said two projectiles within narrow distancing limits within which there exists an axial aerodynamic coupling between said two projectiles, and wherein said axial aerodynamic coupling produces a correcting aerodynamic restoring force in the direction toward the trajectory of said leading first projectile, with said restoring force acting or said second projectile transversely to the longitudinal projectile axis of said second projectile; and

actuatable means for varying the c_w coefficient of at least one of said projectiles during flight, wherein actuation of said actuatable means causes the axial aerodynamic coupling between said projectiles to be maintained within said distancing limits.

5,003,887

GAS GENERATOR FOR INFLATING AN INFLATABLE ARTICLE

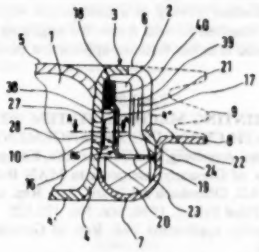
Karl Unterforsthuber, Oberhaching, and Rudolf Koenig, Bruckmuehl, both of Fed. Rep. of Germany, assignors to Bayern-Chemie Gesellschaft fuer flugchemische Antriebe mbH, Aschau am Inn, Fed. Rep. of Germany

Filed Dec. 13, 1989, Ser. No. 450,850

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1988, 3842145

Int. Cl.[5] **B60R** *21/26*

U.S. Cl. 102—531 **12 Claims**



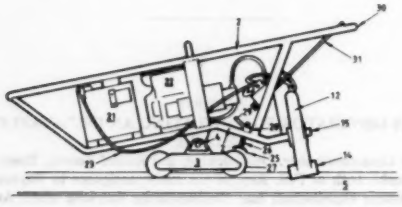
1. A gas generator for inflating an inflatable article, comprising a housing, a reaction chamber in said housing for generating gas, a filter chamber arranged for receiving gas from said reaction chamber, first gas exit opening means (**10** to **15**) in said reaction chamber for a gas flow from said reaction chamber into said filter chamber, second gas exit opening means (**22**) in said filter chamber for a gas flow from said filter chamber into said inflatable article, temperature responsive flow control means arranged in said gas generator for influencing a gas flow from said reaction chamber into said inflatable article in such a way that an inflation duration and an inflation pressure are substantially independent of a gas generator temperature, and wherein said reaction chamber (**4**) has a circular cross-section, wherein said filter chamber has a ring configuration surrounding said reaction chamber, said temperature responsive flow control means comprising a baffle ring (**16**) extending around said reaction chamber with a radial spacing for guiding a flow of generated gas, a ring slide (**28**) rotatably surrounding said reaction chamber in said radial spacing, said a temperature responsive drive member (**40**) connected to said ring slide for driving said ring slide (**28**) between closing and opening positions in response to temperature changes, said baffle ring (**28**) having flow ports (**24, 25, 26**) therein, said ring slide (**28**) having flow port closing wall sections (**32** to **34**) for cooperation with said flow ports (**24, 25, 26**) of said baffle ring (**16**), said temperature responsive drive member (**40**) driving said ring slide (**28**) to close said flow ports (**24, 25, 26**) in said baffle ring in response to a higher gas generator temperature and to open said flow ports (**24, 25, 26**) in said baffle ring in response to a lower gas generator temperature.

5,003,888

RAIL FASTENER APPLICATOR

Richard W. Martin, Sturt, Australia, assignor to McKay Australia Limited, Maidstone, Australia

Filed Aug. 16, 1989, Ser. No. 394,632
Claims priority, application Australia, Oct. 13, 1988, PJ0937
Int. Cl.[5] E01B *29/32*; B61H *13/00*
U.S. Cl. 104—17.002 4 Claims



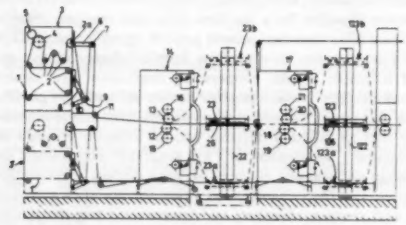
4. A rail fastener applicator comprising a frame with wheels mounted for movement along a rail and fastener applicator arms, said frame being rotatable on said wheels in a vertical plane about a pivot point from a position in which the applicator is moved along the rail so that the fastener applicator arms are clear of the rail to a position where the applicator arms contact the fasteners to apply the rail fasteners to the rail, and a single mechanism serving as a dual height adjustment and brake means attached to said frame for engaging the wheels when said frame is in the fastener application position.

5,003,889

ROTARY PRINTING MACHINE SYSTEM WITH A WEB PATH CHANGING ARRANGEMENT

Wolfgang Glunz, Augsburg, and Gunnar Rau, Königsbrunn, both of Fed. Rep. of Germany, assignors to MAN Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed Feb. 5, 1990, Ser. No. 475,125
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1989, 3905400
Int. Cl.[5] B41F *13/02*
U.S. Cl. 101—228 9 Claims



1. In a rotary printing machine system having a plurality of serially, sequentially positioned operating stations (3, 14, 17, 33, 44) through which a substrate web (1, 31, 31') is guided in an essentially horizontal path between a first operating station and a subsequent operating station,

an arrangement for changing the web path in the printing machine system,

comprising, in accordance with the invention,

a pair of vertically spaced web substrate guide elements (23, 26; 123, 126; 53, 56);

positioning means (22; 122: 52) for selectively movably positioning said pair of guide elements between

a printing position in which the substrate web passes between said guide elements without contacting them, and

a lower position (23*a*), and

an upper position (23*b*);

wherein the upper one (23; 123; 53) of the vertically spaced substrate guide elements is of sufficient strength to support an operator to permit the operator to stand thereon when said substrate guide elements are in their lower position (23*a*) to provide access to an upper region of the operating station, and:

to provide access to the lower region of said operating station when the substrate guide elements are in their upper position (23*b*); and

a web storage means (8, 9, 10; 38, 39, 40) to provide substrate web length upon displacement of said substrate guide elements from said printing position.

5,003,890

STUMP BURNER

Geoffrey C. Newton, 3525 Lombard, Everett, Wash. 98201

Continuation-in-part of Ser. No. 422,872, Oct. 17, 1989, abandoned. This application May 16, 1990, Ser. No. 523,958
Int. Cl.[5] F23D *3/00*, *5/00*
U.S. Cl. 110—239 18 Claims

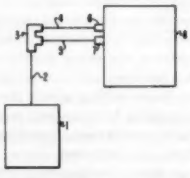
1. A device for burning a stump by use of a combustible fuel comprising a single elongated blast pipe open at least one end and having an open and unobstructed interior, means for supporting said blast pipe in generally upright position with its open end engaged against the stump for containment of a quantity of the combustible fuel in the bottom portion of said pipe adjacent to the stump, and means for injecting air into said pipe for passage through the fuel to intensify combustion thereof adjacent to the open end of said pipe for burning the stump in the area of said open end of said pipe, said supporting means including upright support legs and a collar slidably receiving said blast pipe for permitting free movement of said blast pipe by gravity downward into the stump as the stump is burned away below said pipe.

5,003,891

PULVERIZED COAL COMBUSTION METHOD

Shozo Kaneko, and Masaaki Kinoshita, both of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1990, Ser. No. 485,087
Claims priority, application Japan, Mar. 3, 1989, 1-49874
Int. Cl.[5] F23B *7/00*; F23D *1/02*
U.S. Cl. 110—341 5 Claims



1. A method of combusting coal comprising:

pulverizing a quantity of coal;

blowing the pulverized coal into a rotary classifier having a plurality of blade-like classifying vanes spaced from one another about a rotational axis of the classifier, and drive shift means for rotating the vanes about said rotational axis;

operating the rotary classifier in a manner which separates from the pulverized coal a portion thereof which has a degree of pulverization of 100 mesh residue 1.5% or less;

introducing only said portion of the pulverized coal into a distributor that separates said portion of the pulverized coal and said gas into a thin mixture gas, comprising gas and particles of coal, and a thick mixture gas comprising gas and particles of coal that are larger than those of the thin mixture gas;

injecting the thin mixture gas and the thick mixture gas through respective burner injection ports and into a common furnace at air-to-fuel ratios within ranges of 3–6 and 1–2, respectively, to ignite the mixture gases and thereby combust the coal particles thereof.

5,003,892

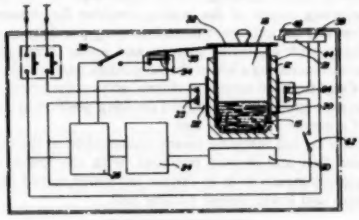
PROCESS FOR STERILE DISPOSAL OF SYRINGES

Jonathan Bricken, New York, N.Y., assignor to D.O.C.C., Inc., New York, N.Y.

Division of Ser. No. 364,019, Jun. 9, 1989, abandoned. This application Apr. 10, 1990, Ser. No. 507,133

Int. Cl.[5] F23G *5/00*; A61L *2/00*

U.S. Cl. 110—346 **10 Claims**



1. A process for preparing syringes having at least a plastic portion and a needle for sterile disposal comprising:

providing a heat conductive container adapted to contain at least one syringe to be prepared for sterile disposal therein;

placing at least one syringe into the heat conductive container; and

applying heat to the heat conductive container in an amount sufficient to melt the at least one syringe so that the plastic of the plastic portion can encapsulate the needle of the syringe to form a molten mass and render the molten mass sterile.

5,003,893

METHOD AND PLANT FOR BURNING SPECIAL WASTE

Martin R. Zweifel, Bahnhofstrasse 48, CH-5430 Wettingen, Switzerland

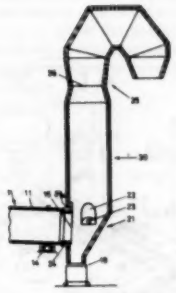
Filed Jul. 28, 1989, Ser. No. 388,031

Claims priority, application Switzerland, Jul. 29, 1988, 2892/88

Int. Cl.[5] F23G *7/06*

U.S. Cl. 110—346 **5 Claims**

1. Method for the combustion of gaseous, liquid and solid industrial waste, the method comprising the steps of providing a first tubular revolving furnace and connecting a second furnace formed as an elongated, upright combustion chamber to said first tubular revolving furnace in series, providing each of said first and second furnaces with means for introducing waste materials thereinto, supplying only part of the waste into and burning said part in the first tubular revolving furnace and supplying the remainder of the waste including gaseous and liquid waste to the combustion chamber, supplying into said combustion chamber a combustion air and, simultaneously with and in addition to said combustion air, supplying a secondary air into said combustion chamber to obtain a complete burning of the waste, wherein flue gases resulting from combustion of the part of waste in the tubular revolving furnace are



introduced into the combustion chamber and mixed with flue gases resulting from the combustion of the remainder of the waste and wherein the secondary air is supplied approximately tangentially into the combustion chamber so that a vortex flow, which is intensified by a constriction provided at an upper end of the combustion chamber, is formed in the combustion chamber.

5,003,894

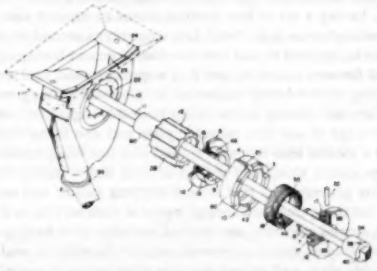
SEEDER CLUTCH FOR TRAMLINES

James G. Lafferty, P.O. Box 7208, Fredericksburg, Va. 22404

Filed Dec. 11, 1989, Ser. No. 448,366

Int. Cl.[5] A01C *7/20*

U.S. Cl. 111—178 **11 Claims**



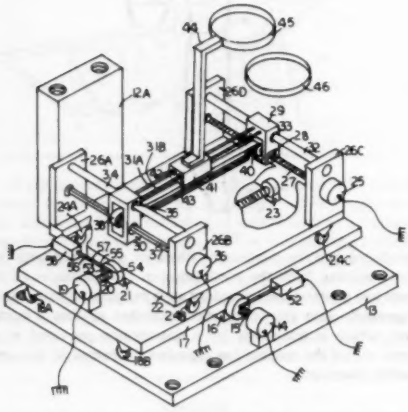
1. The method of forming tramlines in grain fields for guiding field treatment equipment within growing grainfields comprising drilling grain in straight lines across grainfields and forming tractor guiding tramlines devoid of planted grain within the field during the drilling by stopping rotation of selected individual seed meter drums within selected individual seed meter housings during the forming of tractor guiding tramlines while drilling seed, wherein the stopping comprises disengaging individual clutches which connect seed metering drums to a seed meter drive shaft.

5,003,895

EMBROIDERY PANTOGRAPH ASSEMBLY

Lev Talanker, P.O. Box 240458, Brooklyn, N.Y. 11224-0458

Filed Feb. 19, 1988, Ser. No. 157,614
Int. Cl.[5] D05C 5/02; D05B 21/00
U.S. Cl. 112—103 3 Claims



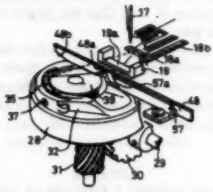
1. An embroidery pantograph having a stationary plate of a first assembly fixed to an embroidery machine table, and having a first stepping motor controlled by a computer, said stepping motor having an output shaft to be rotated at proper times in one or another direction as required to form an embroidery pattern design by moving a work piece under a machine needle according to a specific pattern that is pre-recorded in a computer memory, said first stepping motor being fixed to one edge of said stationary plate and being connected to a first driving screw; said first driving screw being rotatably supported on another edge of the stationary plate and being coupled to a first lead nut which can reciprocate along said first driving screw during rotation motion generated by said first stepping motor; said first lead nut being fixed to a first movable plate having a set of low friction means to support said first movable plate on top of said first assembly; a second stepping motor being fixed to said first movable plate and having operational features similar to said first stepping motor, said second stepping motor being connected to a second driving screw; said second driving screw being rotatably supported on another edge of said first movable plate and also being coupled with a second lead nut; said second lead nut being capable of reciprocation along said second driving screw during rotary motion generated by said second stepping motor; said second lead nut being fixed to a second movable plate serving as a base for a second assembly, said second movable plate having a set of low friction means to provide support therefor on said first movable plate, said second movable plate being connected to a central block by elements including third and fourth stepping motors having operation features similar to said first and second stepping motors; a set of transmission means to convert rotary motion of output shafts of said third and fourth motors into reciprocating motion of said central block along rectangular X-Y coordinates; low friction means to provide a movable support for said central block with respect to said second movable plate; said central block being connected to a solid bracket with a holding assembly to fix a work piece to be embroidered.

5,003,896

DEVICE FOR GUIDING A LOWER THREAD IN A SEWING MACHINE

Kazumasa Hara; Yasuro Sano; Mikio Koike, and Mitsuru Nishijima, all of Tokyo, Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Dec. 16, 1988, Ser. No. 286,383
Claims priority, application Japan, Dec. 18, 1987, 62-191381[U]
Int. Cl.[5] D05B 19/00, 3/02, 57/08
U.S. Cl. 112—121.11 1 Claim



1. A device for guiding a lower thread in a zigzag stitching sewing machine provided with stitch forming means comprising a vertically and laterally movable needle and needle thread catching means cooperating with said needle, a pattern forming means for controlling a lateral reciprocation of the needle, and means for selecting a desired pattern from stored patterns, said guiding device comprising

a lower thread guiding means connected to the pattern selecting means of the sewing machine for determining first and second lower thread drawing positions in accordance with a selected pattern, said lower thread guiding means including a lower thread guiding part which, at one of said first and second positions, acts on the lower thread so as to guide a lower thread drawing position to a center of a needle amplitude; and

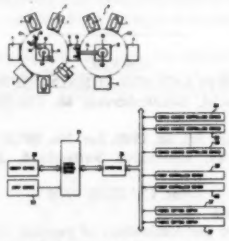
a lower thread releasing means connectable, at the other of said first and second positions, with the lower thread guiding means so as to release the lower thread engaged with said lower thread guiding part.

5,003,897

SEWING SYSTEM

Masaaki Yokoe, Nagoya; Yoshikazu Kurono, Aichi, and Koji Hayashi, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Aug. 18, 1989, Ser. No. 395,521
Claims priority, application Japan, Aug. 20, 1988, 63-206628
Int. Cl.[5] D05B 21/00
U.S. Cl. 112—121.12 7 Claims



5. A sewing system comprising:

a holder for holding a workpiece;

a plurality of sewing machines capable of performing programmed sewing, each of the sewing machines having a reciprocally movable needle, a holding member releasably holding the holder, and driving means effecting relative movement between the needle and the holding member in

accordance with a sewing program for the programmed sewing;

a transferring unit disposed substantially equidistantly with respect to each of the plurality of sewing machines for selectively moving the holder to one of the sewing machines;

identification means for identifying a kind of one of the holder and the workpiece;

a memory unit storing therein sewing programs and data indicative of transferring destinations of the holder by means of the transferring unit, the sewing programs and the destination data being stored with respect to every kind of one of the holder and the workpiece; and

a control unit for reading a sewing program and destination data from the memory unit in accordance with a result of identification by means of the identification means, and fo transmitting the read sewing program to the sewing machine toward which the holder is transferred, as well as for driving the transferring unit in accordance with the destination data.

6. A sewing system comprising:

a holder for holding a workpiece;

a plurality of sewing machines disposed to consist of at least one circular array which defines a central point, each of the sewing machines performing programmed sewing and having a reciprocally movable needle, a holding member releasably holding the holder, and driving means effecting relative movement between the needle and the holding member in accordance with a sewing program for the programmed sewing;

a transferring unit disposed at a position adjacent to the central point of the circular array for selectively moving the holder to one of the sewing machines;

identification means for identifying a kind of one of the holder and the workpiece;

a memory unit storing therein sewing programs and data indicative of transferring destinations of the holder by means of the transferring unit, the sewing programs and the destination data being stored with respect to every kind of one of the holder and the workpiece; and

a control unit for reading a sewing program and destination data from the memory unit in accordance with a result of identification by means of the identification means, and for transmitting the read sewing program to the sewing machine toward which the holder is transferred, as well as for driving the transferring unit in accordance with the destination data.

7. A sewing system comprising:

a holder for holding a workpiece;

a plurality of sewing machines capable of performing programmed sewing, each of the sewing machines having a reciprocally movable needle, a holding member releasably holding the holder, and driving means effecting relative movement between the needle and the holding member in accordance with a sewing program for the programmed sewing;

a transferring unit for selectively moving the holder to one of the sewing machines;

identification means for identifying one of the holder and the workpiece;

a memory unit storing therein sewing programs and data indicative of transferring destinations of the holder by means of the transferring unit, the sewing programs and the destination data being stored with respect to every kind of one of the holder and the workpiece; and

a control unit comprising reading means for reading sewing program and destination data from the memory unit in accordance with a result of identification by means of the identification means, and for transmitting the read sewing program to the sewing machine toward which the holder is transferred, as well as for driving the transferring unit in accordance with the destination data;

judgement means for effecting a decision on employability of the sewing machine associated with the destination data;

a first control means for supplying the sewing program to the sewing machine and for controlling the transferring unit in accordance with the destination data where the decision made in the judgement means reveals that the sewing machine is employable; and

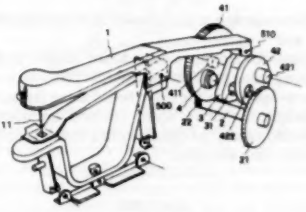
a second control means for searching a substitute sewing machine and supplying the sewing program to the substituted sewing machine as well as for controlling the transferring unit so as to allow the holder to be transferred toward the substituted sewing machine where the decision made in the judgement means reveals that the sewing machine is inoperable.

5,003,898

DRIVING STRUCTURE FOR MINI-SEWING MACHINE

Dennis Huang, 2F, No. 1, Lane 9, Ningpo E. Street, Taipei, Taiwan

Filed Mar. 3, 1989, Ser. No. 318,599
Int. Cl.[5] D05B *69/00*
U.S. Cl. 112—220 **11 Claims**



1. An improved driving structure for a mini-sewing machine, comprising in combination:

an elongated frame body having a front end and a rear end,

a sewing needle rigidly connectable to the front end of said elongated frame body, and arranged to operatively point downwardly,

a sliding block having a pivotal connection to the rear end of said elongated frame body, and being formed with an elongated slot of a predetermined length near a lower end thereof,

a driving gear of a prearranged diameter exceeding the length of said elongated slot, and a cap disposed on respective opposite sides of said sliding block,

coupling means for coupling said driving gear to said cap,

guiding means eccentrically located on said driving gear and on said cap, respectively, and coupled to one another through the elongated slot of said sliding block for operatively imparting a reciprocal movement to said sliding block, and

driving means for operatively rotating said driving gear, and being adapted to be driven by a motor.

5,003,899

APPARATUS FOR DISCONNECTING A NEEDLE BAR AND THREADING ON A SEWING MACHINE

Masao Ogawa, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Sep. 17, 1990, Ser. No. 583,323
Claims priority, application Japan, Oct. 14, 1989, 1-267859
Int. Cl.[5] D05B *55/16, 87/02*
U.S. Cl. 112—221 **25 Claims**

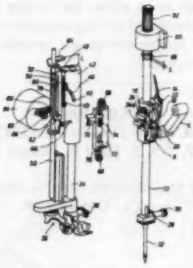
1. A clutch for a sewing machine having a needle bar movably mounted on a frame of the sewing machine, a needle attached to one end of the needle bar, and a sewing transmission for moving the needle bar, the clutch comprising:

a needle bar connecting stud connected to the sewing trans-

mission and slidably mounted on the needle bar such that the needle bar connecting stud may move in either direction along an axis of the needle bar;

click means attached to the needle bar for selectively attaching the needle bar connecting stud to or detaching the needle bar connecting stud from the needle bar;

disconnecting means for operating the click means to detach the needle bar connecting stud from the needle bar when



the disconnecting means rotates in a disconnecting direction; and

drive means for moving a drive board relative to the needle bar along a line parallel to the needle bar, where, when the drive means moves the drive board along the line towards the needle, the drive board contacts the disconnecting means and causes the disconnecting means to rotate in the disconnecting direction.

5,003,900

THREAD SECURING DEVICE IN A SEWING MACHINE

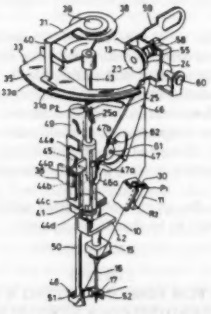
Masao Ogawa, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Continuation of Ser. No. 84,697, Aug. 11, 1987, abandoned. This application Apr. 21, 1989, Ser. No. 342,696

Claims priority, application Japan, Aug. 12, 1986, 61-190269

Int. Cl.[5] D05B *49/00, 87/00*

U.S. Cl. 112—242 **3 Claims**



1. A thread securing device in a sewing machine having a thread source, a needle having a thread eye for carrying an upper thread extending from said thread source, a thread take-up member adapted to move in timed relation to the vertical movement of said needle between a thread loosening position close to a predetermined thread guiding path extending from said thread source to said thread eye of said needle and a thread take-up position spaced away from said thread guiding path, the thread take-up member being operative to catch and hold the upper thread extending along the thread guiding path when said thread take-up member first approaches in the vicinity of the thread loosening position, said thread securing device comprising:

thread saving means having a thread saving plate extending horizontally from said thread guiding path, said thread saving plate being capable of saving an amount of the upper thread corresponding to a predetermined amount of the upper thread to be taken up by said thread take-up member during its movement from the thread loosening position to the thread take-up position and capable of feeding the saved amount of the upper thread freely in accordance with the thread take-up movement of the thread take-up member; and

actuating means adapted to catch the upper thread extending along said thread guiding path when said thread takeup member is not holding the upper thread and then supply an amount of the upper thread corresponding to said predetermined amount to said thread saving means.

5,003,901

FEEDING RATE ADJUSTING UNIT OF A SEWING MACHINE

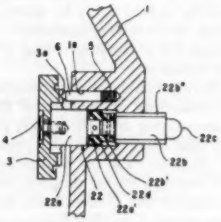
Shuichi Sato, and Yoshiharu Kobayashi, both of Utsunomiya, Japan, assignors to SSMC Inc., Edison, N.J.

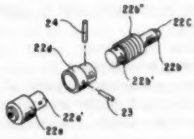
Filed Jul. 3, 1989, Ser. No. 374,820

Claims priority, application Japan, Aug. 1, 1988, 63-101094[U]

Int. Cl.[5] D05B *27/22*

U.S. Cl. 112—316 **4 Claims**





1. A unit for adjusting a feeding rate of a sewing machine having a body of an arm, said unit comprising:

a feeding rate adjustment shaft screwed into the body, said shaft having first and second opposite ends, the first end terminating in a tip;

a feeding rate adjusting dial secured to the second end of the shaft and having an inner circumference spaced from and adjacent to the second end of the shaft, the dial having a plurality of teeth spaced apart and disposed along a circle on a surface of the inner circumference;

a stopper receiver bore disposed in the body spaced from and parallel to the shaft;

a stopper in said bore;

spring means disposed in said bore and engaging the stopper to cause the stopper to be in meshing position with one of said teeth;

a feeding adjusting table;

a link;

a feeding adjusting cam connected by the link to the feeding adjusting table;

the feeding adjusting cam having at one end a cam surface provided with a normal feeding control surface and a reverse feeding control surface, the tip end of the feeding rate adjusting shaft engaging the cam surface to thereby vary an inclination angle of the feeding adjusting table, to adjust the feeding rate in a normal or reverse feeding operation accordingly;

the feeding adjusting shaft including a dial securing table secured to the fixing adjusting dial and a cam contact member,

one of said dial securing table and said contact member secured to said body; and

an elastic member disposed between and coupled to the dial securing table and said cam contact member.

5,003,902

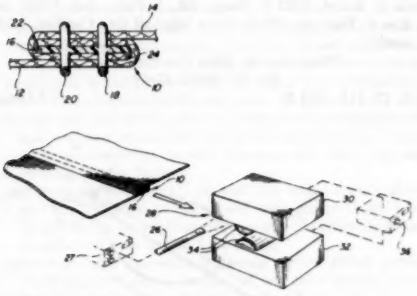
SEAM HAVING LIQUID PROOF THREADS STICHABLY SECURING FIRST AND SECOND LIQUID PROOF MATERIALS FOLDABLY ENCLOSING A MELTABLE ADHESIVE POLYMER FILM AND METHOD OF MANUFACTURE OF SAME

Gerald M. Benstock, Belleair Beach; Nathan L. Belkin, and Robert Green, both of Clearwater, Fla., assignors to Superior Surgical Manufacturing Co. Inc., Seminole, Fla.

Filed Oct. 13, 1989, Ser. No. 420,908

Int. Cl.[5] A41D *3/04, 13/00, 13/12;* **D05B** *1/26*

U.S. Cl. 112—418 **18 Claims**



1. A liquid proof seam, comprising:

a first liquid proof fabric material;

a second liquid proof fabric material having at least a portion thereof in overlapping relationship with at least a portion of the first material;

a melt adhesive polymer film means having upper and lower opposite facing surfaces disposed between the overlapping portions of the first material and the second material for bonding the overlapping portions together to form a seam area;

first fold means in said first liquid proof fabric material to position portions of said first liquid proof fabric material on said upper and lower surfaces of said polymer film means;

second fold means in said second liquid proof fabric material to position portions of said second liquid proof fabric material on said upper and lower surfaces of said polymer film means;

said positioned portions of said first and second liquid proof fabric material coacting to completely enclose said polymer film means; and

a liquid proof thread means extending through the first nd second materials and the overlapping portions and the film means for fixedly securing the the seam area;

wherein the film means melt bonds the overlapping portions of the first material and the second material together and is disposed in apertures around the thread means.

5,003,903

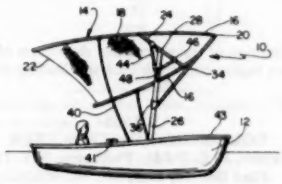
FLUID FOIL SYSTEM

Eric Olsen, Box 578, Marion, Mass. 02738

Division of Ser. No. 144,657, Jan. 12, 1988, Pat. No. 4,864,949, Continuation of Ser. No. 266,884, May 26, 1981, abandoned. This application Jun. 26, 1989, Ser. No. 372,196

Int. Cl.[5] B63H *9/08*

U.S. Cl. 114—102 **14 Claims**



1. A fluid foil system for imparting energy from a moving fluid medium to a supporting body which body in turn is supported by means other than said moving fluid medium, said system including a fluid foil connected to a mast along a longitudinal axis thereof, said foil supported for free multi-rotational movement with respect to said body, said foil further adapted for lateral tilt in either direction with respect to said mast about said longitudinal axis from a "level" rest position where said foil is generally aligned with the directional flow of said fluid medium to a tilted position wherein said fluid imparts energy to said foil, and structural self-aligning means for said foil connected to both said foil and said mast and adapted to urge said foil to said rest position, wherein said self-leveling means is adapted to automatically return said foil to its rest position when free from other constraints, said system further including foil tilt limiti..g means separate from said self-leveling means for limiting the extent of lateral tilt which said foil may exhibit.

5,003,904

KEEL ASSEMBLY

William Unger, 1006 - 420 Mill Road, Etobicoke, Ontario, Canada M9C 1Z1, and Lawrence A. Caza, 46655 Russell Road, Sardis, British Columbia, Canada V2R 1B

Filed Apr. 26, 1989, Ser. No. 344,240

Int. Cl.[5] A63C *15/06*

U.S. Cl. 114—140 **8 Claims**

1. A keel assembly for a watercraft comprising:

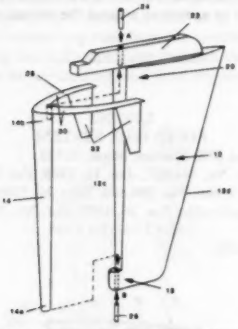
a body having a pair of side faces and a leading edge extending the length of said body, said body having a leading portion and a trailing portion, at least a portion of said leading edge being located on said leading portion;

first connecting means connecting said leading portion with said trailing portion for movement relative thereto;

vane means to be disposed within a flow of water relative to said body, said flow having a direction of travel wherein said vane means extends rearwardly of said leading edge; and

second connecting means joining said vane means with said leading portion, said second connecting means constitut-

ing means to transmit movements of said vane means to said leading portion to orient said leading portion towards

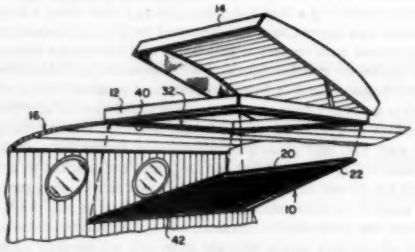


said direction of travel to offset the effects of a negative pressure region occurring near said leading edge.

5,003,905
COLLAPSIBLE HATCH SCREEN

Peter H. Raynor, 30 E. 3rd St., Patchogue, N.Y. 11772

Filed Dec. 14, 1989, Ser. No. 450,813
Int. Cl.[5] B63B *19/12*
U.S. Cl. 114—201 R **7 Claims**



1. A collapsible hatch screen to cover a hatch frame with a hatch cover on a boat comprising:

(a) a square shaped screen frame being rigid at all four sides and bendable at all four corners thereof;

(b) a square shaped piece of screening sized to fit within said screen frame;

(c) a square shaped border member which covers said screen frame and is attached to all four edges of said piece of screening so that said screen frame can be folded and rolled up into compact configuration for storage; and

(d) a pouch sized to receive said folded and rolled up collapsible hatch screen for storage when not in use.

5,003,906
APPARATUS AND METHOD FOR AUTOMATIC OPERATION OF A BILGE BLOWER

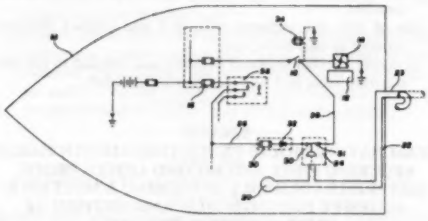
Phillip R. Sova, Indian River, Mich., assignor to Technological Safety Design, Inc., Indian River, Mich.

Filed Dec. 13, 1989, Ser. No. 450,218
Int. Cl.[5] B63J *2/06*
U.S. Cl. 114—211 **13 Claims**

1. In combination with a water craft having an engine compartment, a blower for purging the compartment of noxious vapors, the blower including a manual blower switch for operating the blower, an electrical system for energizing the water craft and the blower switch, and a pressure-sensitive speedometer including an inlet tube, the pressure-sensitive speedometer being responsive to fluid pressure exerted along the inlet tube by movement of the water craft through ambient water, an improvement comprising:

a normally closed pressure switch connected to the inlet tube, said pressure switch being continuously openable in response to fluid pressure in the inlet tube at speeds above a predetermined speed of the water craft,

a first electrical path between the electrical system and said pressure switch, and



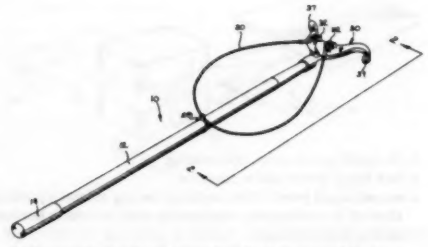
a second electrical path between said pressure switch and the blower and in parallel with the blower switch,

wherein said pressure switch bypasses the manual blower switch so that the blower is operated pressure responsively by said pressure switch, irrespective of the manual blower switch when the speed of the water craft is below said predetermined speed.

5,003,907
BOAT HOOK

John E. Roach, 5582 N. Range Rd., LaPorte, Ind. 46352, and Kim S. Parrette, 779 E. Lake Mitchell Dr., Cadillac, Mich. 49601

Filed May 20, 1988, Ser. No. 196,665
Int. Cl.[5] B63B *21/04*
U.S. Cl. 114—221 R **3 Claims**



1. A mooring and maneuvering device comprising:

a rigid, elongated pole member having a handle end and a distal end, said distal end having a hook carrying means extending transversely from the longitudinal axis of said pole;

said hook carrying means being generally Y-shaped with projecting legs, one leg of said hook carrying means being elongated and turned outwardly back upon its self to form a hook; and

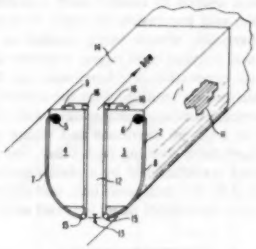
said hook carrying means having an edge portion extending between its said legs, said edge portion being concave to form a cradle, said distal end carrying a flexible loop means for engagement with a mooring device, said loop means including opposite ends, said loop means ends being pivotally connected to said distal end with said loop means being extensible from said pole member.

5,003,908

CONTROL AND LIMITING OF OIL SPILLS FROM AN OCEAN GOING TANKER

Robert A. Wilson, 10 Hillside Pl., Cranford, N.J. 07016

Filed Apr. 17, 1989, Ser. No. 339,202
Int. Cl.[5] B63B *43/16*
U.S. Cl. 114—229 **1 Claim**



1. An apparatus for limiting the leakage of liquid product form a leak in a tank of a tanker vessel, said tanker vessel having a deck, a keel, a starboard side, and a port side, said apparatus comprising:

a first winch and a second winch, said first winch and said second winch being located on said deck, said first winch being further located adjacent said starboard side, and said second winch being further located adjacent said port side;

a first rolled curtion and a second rolled curtain, said first rolled curtain being located in a first recessed covered compartment on said starboard side above said tank at said deck, said second rolled curtain being located in a second recessed covered compartment on said port side above said tank at said deck;

a pair of cables, one of said cables connecting said first winch and said first rolled curtain, the other of said cables connecting said second winch and said second rolled curtain;

an opening in said tanker vessel extending from substantially said keel to substantially said deck;

two pair of cable guides, one pair being located adjacent said keel and said opening at said keel, the other pair of said cable guides being located adjacent said deck and said opening at said deck;

said one cable extending form said first rolled curtain along said starboard side to one of said cable guides at said keel, upwardly through said opening to one of said cable guides at said deck, and to said first winch;

said other cable extending from said second rolled curtain along said port side to another of said cable guides at said keel, upwardly through said opening to another of said cable guides at said deck, and to said second winch;

whereby said winches can be used with said cables to unroll downwardly on the sides of said tanker vessel said rolled curtains so as to cover said leak.

5,003,909

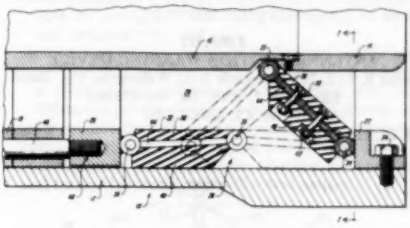
SUBMARINE TORPEDO TUBE COLLAPSIBLE CHOKE

Paul E. Moody, Barrington, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 18, 1990, Ser. No. 542,627
Int. Cl.[5] B63G *8/28*; F41F *3/10*
U.S. Cl. 114—238 **12 Claims**

1. A bimodal flow restriction device enabling to provide in one mode pump-ejection and in another mode swim-out of a torpedo in a torpedo tube of larger diameter than that of the torpedo defining thereby an annular fluid flow path between the torpedo tube and the torpedo, comprising:

means mounted in the torpedo tube for providing a mechanical impediment movable between an open state where the mechanical impediment is free of the annular fluid flow path and a closed state where the mechanical impediment impedes the annular flow path; and



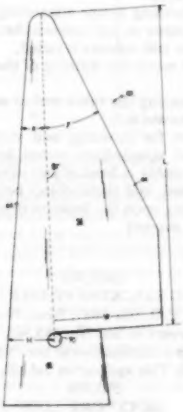
means for selectively moving the mechanical impediment between its open and its closed state.

5,003,910

ANCHOR

Bruce S. Wilkinson, Gloucester, Mass., assignor to Rule Industries, Inc., Burlington, Mass.

Filed Sep. 11, 1989, Ser. No. 405,542
Int. Cl.[5] B63B *21/44*
U.S. Cl. 114—304 **3 Claims**



1. A twin-fluke anchor comprising:

a shank with a first end and a second end,

a stock,

a pair of fluke elements mounted upon said stock in a manner to pivot as a unit at the second end of the said shank, each said fluke element comprising a fluke defining a fluke surface disposed in a first plane, and a rib disposed generally perpendicular to said first plane and extending in one direction only from said fluke surface, said shank disposed between said ribs, and

a crown comprising a pair of substantially flat crown plates, each said crown plate being supported centrally of said flukes in a position wherein said crown plate is spaced from said first plane of said flukes, each said crown plate sloping upwardly and rearwardly away from said first plane of said flukes in a manner to permit bottom material to flow freely between said inner surfaces of said crown plates and said flukes,

each said fluke element further comprising an integral

bracket extension, said crown plates being mounted upon said bracket integral extensions, and

each said fluke element comprising an integral, jointless unit of said fluke, said rib and said bracket extension formed from a single sheet of stock material.

5,003,911

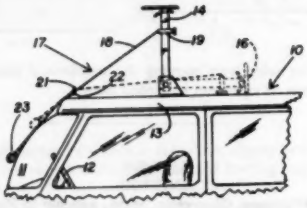
ANTENNA POSITION WARNING DEVICE

Charles F. Keil, 783 Foresteria Ave., Wellington, Fla. 33414

Filed Nov. 7, 1989, Ser. No. 433,007

Int. Cl.[5] G08B *5/02*

U.S. Cl. 116—28 R 6 Claims



1. In combination, a recreational vehicle having a front windshield, a roof, and a roof antenna with an adjustable vertical angle, and a warning device mounted on said vehicle to indicate when said antenna is raised, said warning device comprising:

(A) a flexible strand,

(B) antenna-connecting means connecting one end of said strand to a location on said antenna that is distanced from said roof when said antenna is raised,

(C) signal-object means for warning of the elevation of said antenna,

(D) means connecting the other end of said strand to said signal-object means and,

(E) guide means for directing said strand whereby the weight of said signal-object means lowers said signal-object means visibly in front of said windshield when said antenna is raised, said signal-object being lowered a distance depending upon the location of attachment of said strand to said antenna.

5,003,912

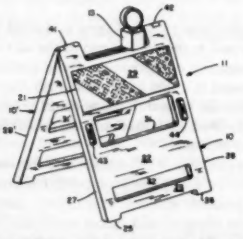
INTERLOCKING STACKING PLASTIC BARRICADES

Kurt W. Thurston, P.O. Box 1887, Reno, Nev. 89505

Continuation-in-part of Ser. No. 183,382, Apr. 13, 1988, abandoned, which is a continuation of Ser. No. 25,604, Mar. 13, 1987, abandoned. This application Jul. 20, 1989, Ser. No. 383,298

Int. Cl.[5] E01F *13/00*

U.S. Cl. 116—63 P 5 Claims



1. An interlocking, stackable plastic barricade constructed from two substantially similar generally planar panel units hinged together to pivot around a common axis of rotation, each of said panel units having left and right edges when an outside face of said hinged barricade is directly viewed by an observer, each of said panel units being one piece, hollow, integrally molded plastic, the invention being characterized by each of said panel units including at least one pair of interlocking means located on said outside face of each of said panel units proximate to said left and right edges of said panel unit, one of said pair of interlocking means being rectangular shaped indentation in and the other a rectangular shaped protrusion from said outside face, said indentation and protrusion being dimensioned and shaped to closely mate together but to be freely separable, said protrusion for each of siad two panel units of said barricade always being located on a predetermined one of said left and right edges, whereby assuming the same lengthwise orientation of a barricade, one folded barricade may be stacked on another, with the interlocking means of said one barricade automatically mating with the interlocking means of an adjacent barricade and facing planar panel units of both barricades abutting each other, and each of said panel units being manufactured by a plastic molding process using an identical die for each panel unit, said die providing for formation of both the overall panel unit and said interlocking means.

5,003,913

CHAIN ELONGATION INDICATOR AND METHOD

David G. Jensen, 120 Granada Dr., Apt. #15, Mountain View, Calif. 94043

Filed Jun. 12, 1989, Ser. No. 364,148

Int. Cl.[5] G01D *21/00*; G01B *5/02*

U.S. Cl. 116—208 3 Claims

2. A chain elongation indicator for a chain having a first link reference point on a first chain link and a second link reference point on a second chain link, comprising:

an indicator body having first and second indicator reference holes, such that the distance between the first and second indicator reference holes corresponds to a predetermined percentage of the distance between first and second link reference points of a non-elongated chain, and such that when the first indicator reference hole is aligned with the first link reference point and the second indicator reference hole is aligned with the second link reference point, chain elongation is observed; and

receiving means extending from the indicator body for receiving the chain so that the first reference point on the first link will be aligned with the first indicator reference hole.

5,003,914

INDICATING INSTRUMENT

Klaus Mayer, Obertshausen, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 287,474, Dec. 19, 1988, abandoned. This application Mar. 8, 1990, Ser. No. 492,376

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 8716940[U]; Feb. 11, 1988, 3804144; Aug. 27, 1988, 3829080

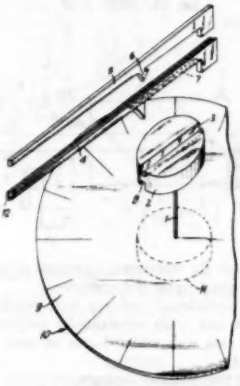
Int. Cl.[5] G01D *13/22*

U.S. Cl. 116—332 4 Claims

1. An indicating instrument comprising: a transparent elongated light-conducting pointer having a first end and a second end opposite said first end, the pointer having a detent projection located away from both ends of the pointer and extending outward of the pointer;

a pointer shaft with a cap assembly thereon; and

wherein said cap assembly comprises a cap portion and a support portion, the cap portion having a top surface and a bottom surface, said shaft extending from said bottom surface, said support portion extending radially outward from an axis of said shaft and along the top surface of said cap portion; and



said support portion includes an elongated channel having a first end and a second end opposite said first end for receiving said pointer, there being an opening in said channel located away from both ends of the channel, the opening extending through said cap assembly from said channel to said bottom surface, said detent projection extending through said opening to engage with said bottom surface for locking said pointer in said channel.

5,003,915

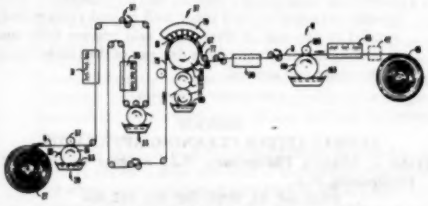
APPARATUS FOR PRINTING AND FOR FORMING A HOLOGRAM ON SHEET MATERIAL

Salvatore F. D'Amato, Floral Park, N.Y.; Peter Sorbo, Stamford, Conn., and Richard E. Dunning, Claremont, Calif., assignors to American Bank Note Holographics, Inc., Elmsford, N.Y.

Division of Ser. No. 183,005, Apr. 18, 1988, Pat. No. 4,933,120. This application Aug. 23, 1989, Ser. No. 397,585

Int. Cl.[5] B05C *1/16;* **B05D** *5/06;* **B29D** *11/00*

U.S. Cl. 118—46 **8 Claims**



1. Apparatus for processing a substrate, comprising:

means including a source of said substrate for continuously moving said substrate through at least first and second work stations in succession,

one of said first and second work stations including means for repeatedly forming a plurality of discrete surface relief light diffraction patterns on at least one side of said substrate, said diffraction pattern forming means including:

a master of said surface relief light diffraction pattern,

a source of a liquid casting resin,

means receiving resin from said source for holding resin between the substrate and the master surface relief pattern in a defined area surrounded by substrate without resin applied thereto and for a period of time without relative movement therebetween,

means including a source of radiation directed at said held resin for curing said resin into a hardened state within said period of time, and

means for separating the substrate from the master after said period of time, thereby to leave the hardened resin in place on said substrate with the surface relief light diffraction pattern of said master contained therein, and

another of said first and second work stations including means for printing a given visual pattern with ink on at least regions of said at least one substrate side not occupied by said hardened resin diffraction pattern.

5,003,916

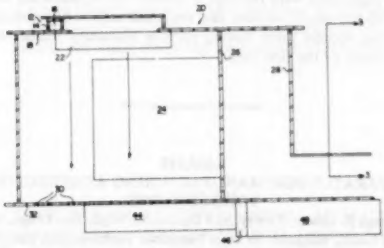
ADHESIVE SUPPLY UNIT

Paul J. Donley, Monterey, Calif., assignor to Graco Inc., Minneapolis, Minn.

Filed Apr. 8, 1988, Ser. No. 179,518

Int. Cl.[5] B05C *11/10*

U.S. Cl. 118—429 **1 Claim**



1. An adhesive supply unit comprising:

a tank having first and second ends, a top and a bottom;

means for heating said tank adjacent said tank bottom;

an electronic control mechanism for controlling the temperature of adhesive from said tank, said control mechanism being located adjacent said tank first end;

a cabinet having a top and substantially containing said tank and said control mechanism;

a fan located in said cabinet top above said control mechanism and oriented so as to blow ambient air from outside said cabinet downwardly across said control mechanism; and

an inlet in said cabinet top for ambient air for said fan, said opening facing away from said tank.

5,003,917

DEVELOPING APPARATUS WITH IMAGE QUALITY CONTROL

Naoki Toyoshi; Tateki Oka, and Hiroshi Goto, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 10, 1989, Ser. No. 391,955

Claims priority, application Japan, Aug. 12, 1988, 63-202491; Aug. 12, 1988, 63-202492; Aug. 12, 1988, 63-202493; Aug. 26, 1988, 63-213309

Int. Cl.[5] G03G *15/08*

U.S. Cl. 118—653 **15 Claims**

1. A developing apparatus for forming a toner image onto an image carrier comprising:

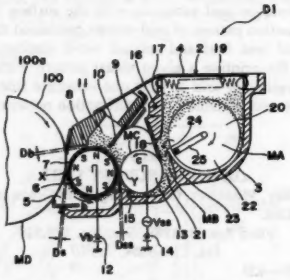
a toner hopper in which toner is accommodated,

a toner supply member adapted to contact the toner accommodated in said toner hopper for supplying the toner to the image carrier,

a toner thickness restricting member held in contact with

said toner supply member so as to form a thin layer of toner by passing toner through a portion between said restricting member and the toner supply member,

a supply section provided in the toner supply and located at the side of the toner supply member for supplying toner to the toner supply member, said supply section accommodating first toner, and



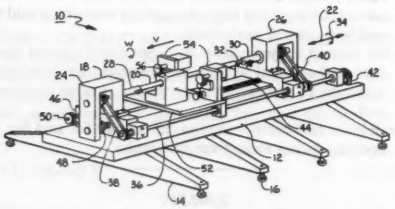
a replenish section provided in the toner hopper and communicated with the supply section for replenishing toner to the supply section, said replenish section accommodating second toner having particle diameters smaller than those of the first toner.

5,003,918

APPARATUS FOR MANUFACTURING ATHERECTOMY TORQUE TUBES

Thomas E. Olson, Poway, and Dennis M. Vigil, San Diego, both of Calif., assignors to InterVentional Technologies, Inc., San Diego, Calif.

Filed Dec. 28, 1989, Ser. No. 458,326
Int. Cl.[5] B05C *11/00*
U.S. Cl. 118—665 **12 Claims**



1. An apparatus for manufacturing atherectomy torque tubes, comprising:

means for winding a wire around a tube liner with a selected pitch and wire separation to provide a wound tube;

means for applying a coating onto said wound tube at a rate which generates a thickness of material to establish an outside diameter for said tube;

means for providing a signal representing a desired outside diameter;

means for measuring said outside diameter of said coated tube and generating a signal representative of an amount of deviation of said measured diameter from said desired diameter; and

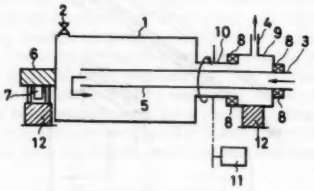
control means coupled to said coating means and said winding means for varying said rate of application of said coating to attenuate said deviation signal, while maintaining said selected pitch and wire separation on said tube.

5,003,919

APPARATUS FOR STABILIZATION TREATMENT OF FERROMAGNETIC METAL POWDER

Tetsushi Yamamoto; Masaru Niwano, and Etsuo Nakagawa, all of Minamata, Japan, assignors to Chisso Corporation, Japan

Continuation of Ser. No. 154,324, Feb. 10, 1988, abandoned. This application Jun. 9, 1989, Ser. No. 364,489
Claims priority, application Japan, Feb. 12, 1987, 62-30558
Int. Cl.[5] B05C *3/08*
U.S. Cl. 118—716 **4 Claims**



1. An apparatus for stabilizing treatment of ferromagnetic metal powder, which apparatus comprises:

a horizontal, cylindrical, rotating type reactor body provided with end walls substantially perpendicular to a cylindrical side wall which forms an inner wall of said reactor body;

a jacket for a heat transfer medium;

a port including a valve for feeding said ferromagnetic metal powder into said reactor body;

a port for withdrawing said ferromagnetic metal powder from said reactor body, which port may be used in common with said feeding port;

a passageway for blowing an oxidizing gas into said reactor body comprising an oxidizing gas inlet in communication with a pipe arranged within said reactor body coaxially with respect to the axis of rotation of said reactor body, said passageway arranged to be in substantial non-contacting relationship with ferromagnetic metal powder and said pipe, having an outlet end, extends longitudinally through said reactor body, said outlet end positioned proximate the side wall remote from said oxidizing gas inlet;

a passageway for withdrawing said oxidizing gas from said reactor body comprising an oxidizing gas outlet in communication with a duct connected to said reactor body and arranged coaxially with respect to the axis of rotation of said reactor body, said passageway arranged to be in substantial non-contacting relationship with ferromagnetic metal powder; and

a plurality of scraping up plates for said ferromagnetic metal powder arranged on said inner wall of said reactor body parallel to the axis of rotation of said reactor body and extending longitudinally from one end of the reactor body to the other end thereof.

5,003,920

ANIMAL LITTER CLEANING APPARATUS

Frank J. Miksitz, Phillipsburg, N.J., assignor to UFI, Inc., Phillipsburg, N.J.

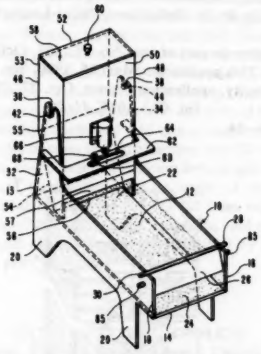
Filed Jul. 13, 1990, Ser. No. 552,304
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—163 **19 Claims**

1. An animal litter apparatus comprising;

a trough to support a bed of litter and having a first charging end and second discharging end;

a litter supply bin having a horizontal slot to define a litter discharge opening in a bottom portion of said bin, said discharge opening having a width and a height, and wherein said supply bin is pivotally mounted above the trough for oscillating movement in a longitudinal direction to the trough,

oscillating means to oscillate said supply bin whereby litter in said supply bin falls by gravity onto said trough during



a rearward movement of said bin and incrementally pushes said litter on the trough toward said discharge end of the trough to form a litter bed.

5,003,921

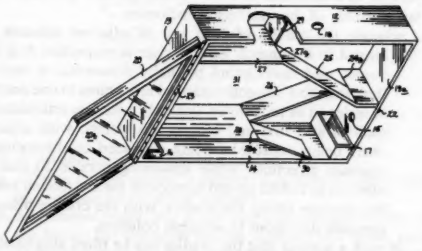
LIVE PICTURE CONSTRUCTION

Darrel C. Tracy, 8407 Dunlap #2, Anchorage, Ak. 99504

Filed Feb. 28, 1990, Ser. No. 486,281

Int. Cl.[5] A01K *63/00*

U.S. Cl. 119—5 **5 Claims**



1. A wall mounted picture organization for maintenance and display of live creatures therewithin, comprising in combination,

a cabinet framework including spaced parallel right and left side walls, spaced parallel top and bottom walls, the walls integrally and orthogonally secured to a rear wall, and

a window framwork including a transparent window mounted thereto, wherein the window framwork is of a perimeter configuration equal to a perimeter configuration defined by forward edge of the walls of the cabinet framework, and

wherein the window framework is pivotally mounted at one end to a forward edge of a wall of the cabinet framework, and where in the window framework includes a latch at an opposed end relative to the one end securable to a latch receiving member mounted on an exterior surface of a wall of the cabinet framework, and

a mounting member secured to a rear surface of the rear wall for securement to a vertical wall surface, and

food and water trough members integrally mounted within the cabinet framwork for support and feeding of the creatures, and

wherein ramp means are integrally mounted within the cabinet framework for affording exercise to the creatures therewithin, wherein the ramp means include a first divider wall medically and orthognoally mounted to an interior surface of the right wall and directed interiorly thereof terminating in a first joinder line, and a first and second ramp mounted at their right ends to the first joinder line, and secon and third divider walls orthogonally mounted to an interior surface of the left side wall terminating in respective second and third joinder lines, and the first and second ramps respectively mounted to the second and third joinder lines at left ends of the respective first and second ramps, and

wherein the trough members are mounted to the bottom wall contiguous with respective opposed interior surfaces of the right and left side walls, and

wherein the bottom wall includes a through-extending bottom wall vent apertures, and the top wall includes a through-extending top wall aperture for providing cooperative ventilation through the cabinet framework, and

including a vertical rib mounted to the second jointer line and to an interior surface of the top wall, and a third ramp mounted to an interior surface of the bottom wall and to the third joinder line to provide geometric integrity to the ramp construction within the cabinet framework, and

further including a spring biased flexible shade mounted to a forward edge of a top wall of the window framework, wherein the window shade is mounted at an upper end to a spring biased support roll and includes a grasp handle at a lowermost edge of the shade to enable selective extension at the shade overlying the transparent window.

5,003,922

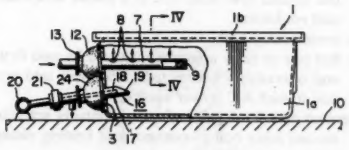
CAGE FOR SMALL EXPERIMENTAL ANIMALS

Motohiro Niki; Etsuko Niki, both of 2-22-11, Yushima, Bunkyo-Ku, Tokyo-To; Misako Kidachi; Atsushi Kidachi, both of 1-3-7, Mitsuji, Taito-Ku, Tokyo-To; Mieko Niki, 2-22-11, Yushima, Bunkyo-Ku, Tokyo-To, all of Japan; Kap J. Lee, and Yun Lee, both of R.R.#1, Box 123, Grand Forks, N. Dak. 58201

Filed Mar. 12, 1990, Ser. No. 492,551

Int. Cl.[5] A01K *1/00*

U.S. Cl. 119—15 **6 Claims**



1. A cage for confining and raising experimental animals, comprising:

enclosure means for confining an animal, including a casing and a substantially horizontal lid at the top of the casing, the casing having a side wall with an opening;

an air supply conduit connected to an air supply source and passed through said opening to extend into the enclosure means, said conduit extending in a substantially parallel relation to the lower surface of the lid with a spacing between the conduit and the lid, said conduit having upper and lower surfaces, said lower surface being continuous along its length and said upper surface having air supply holes formed in the conduit at intervals along the length of the conduit and directed upwardly to supply air flows against the lower surface of the lid; and

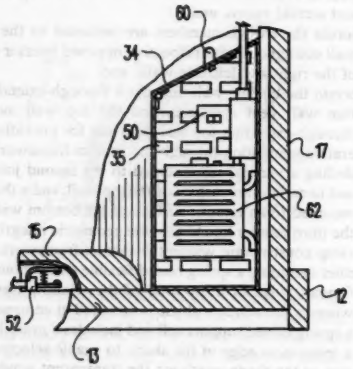
means for exhausting air within the enclosure means.

5,003,923

HEATED PET HOUSE

Sonny D. Morgan, Rte. 1 Box 4, Oceana, W. Va. 24870

Filed Jun. 23, 1989, Ser. No. 370,178
Int. Cl.[5] A01K *1/00*
U.S. Cl. 119—19 1 Claim



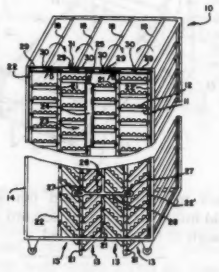
1. A heated pet house, comprising:
a covered enclosure having a hollow interior portion;
a door in a side wall of said enclosure for allowing pet entry and exit;
a hinged roof on said enclosure for allowing human access to said hollow interior portion;
an electrical resistance heating element in said hollow interior portion;
an indicating lamp operably connected to indicate operation of said heating element;
a transformer having a primary stage connected to an AC power source;
first switch means for selectively manually disconnecting said primary stage from said AC power source;
said transformer having a secondary stage connected to a rectifier for producing reduced voltage DC current;
a first relay coil;
a thermostat for connecting said DC current from said rectifier to said first relay coil at a preset temperature within said enclosure;
a second relay coil;
a first pair of relay contacts activated by said first relay coil and operatively connected to connect said second relay coil to said AC power source;
second and third pairs of relay contacts activated by said second relay coil to connect said heating element to said AC power source;
a housing enclosing said heating element and having a back wall provided with spaced, projecting guide runners;
vertical recessed guide tracks in said enclosure for removably receiving said guide runners to facilitate manual removal and installation of said heater;
second switch means operatively connected for connecting said DC current from said rectifier to said first relay coil only when a pet is within said hollow interior enclosure portion; and
said second switch means including a pressure sensitive switch possessing spaced closable contact members separated by a coil spring; and
said closable contact members disposed within a recessed interior portion of a resilient pad disposed on a floor of said hollow interior portion for actuation by a pet's weight on said floor.

5,003,924

EGG INCUBATION CARRIAGE FOR A VENTILATED INCUBATION ENCLOSURE

Pierre Dambre, Chalonnes-sur-Loire, France, assignor to Elevage Avicole de la Bohardiere, Saint-Laurent-de-la-Plaine, France

Continuation-in-part of Ser. No. 262,455, Oct. 25, 1988, abandoned. This application Mar. 26, 1990, Ser. No. 498,840
Claims priority, application France, Oct. 27, 1987, 87 14847
Int. Cl.[5] A01K *41/06*
U.S. Cl. 119—44 4 Claims



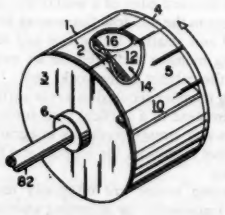
1. An egg incubation carriage for a ventilated incubation enclosure has egg-receiving cradles which are superposed in columns, said carriage including a plurality of adjacent pairs of juxtaposed columns with the cradles of each column being tiltable in one direction or the other in alternation while remaining parallel with each other, the carriage being disposed in such a manner that the planes of the cradles are substantially parallel to a direction of a ventilation air flow provided by a fan assembly of the incubation enclosure,
wherein the cradles of each pair of adjacent columns are hinged to a common vertical riser at respective first link points, said risers being pivotally connected at each of their ends to a respective second link points to one another in series so as to form an assembly which is articulated at each of said first and second link points, with adjacent risers being capable of being displaced in alternation in opposite directions while remaining parallel to one another so as to fold up and spread out the articulated assembly, thereby tilting the cradles, with the cradles tilting in opposite directions in adjacent columns,
in such a manner that the cradles can be tilted alternately in opposite directions without splitting up the columns which would establish empty passages between adjacent pairs of columns and interfere with proper ventilation.

5,003,925

FISH FOOD DISPENSER

John D. Roberts, P.O. Box 568, Lemont, Pa. 16851

Filed Dec. 8, 1989, Ser. No. 447,591
Int. Cl.[5] A01K *1/10*
U.S. Cl. 119—51.04 3 Claims



1. A dispenser of dry fish food comprised of: a casing

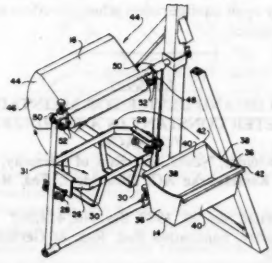
mounted on a horizontal power shaft for rotation therewith, a chamber within said casing defined by peripheral and radial walls, said chamber stores dry fish food for dispense, a dispense port through said peripheral wall of said chamber, a chute mounted on said peripheral wall surrounding said dispense port, said chute forming an opening into said chamber, a chute opening, facing opposite to the direction of rotation, a scoop mounted on the peripheral wall within said chamber facing said chute opening, and following it during rotation, and said scoop spaced apart from said chute to allow food to flow freely between; whereby rotation of said casing causes said scoop to pass through the bottom of said chamber and fill with the food stored therein, and continued rotation brings said full scoop to the top of said chamber where its angle of inclination approaches vertical, causing the food to fall from said scoop, and whereby some of the falling food returns to said chamber, and some enters said chute opening and is guided by said chute to said dispense port.

5,003,926

CATTLE FEEDING TROUGH

Lyle A. Bratrud, R.R. #1, Bawlf, Alberta, Canada T0B 0J0

Filed Jun. 14, 1990, Ser. No. 538,001
Claims priority, application Canada, Jun. 15, 1989, 602938
Int. Cl.[5] A01K *5/00, 7/00*
U.S. Cl. 119—62 **7 Claims**



1. A cattle feeding trough, comprising:

a. a frame having means to support a container and at least one substantially vertical support;

b. a container positioned in the container support means of the frame, the container having opposed end walls, each of the end walls having a concave peripheral edge; and

c. a closure lid pivotally mounted to the vertical support whereby the closure lid is positioned over the container, the closure lid having opposed end walls, each of the end walls having a convex peripheral edge such that the convex peripheral edges of the closure lid end walls can be positioned in close proximity with the concave peripheral edges of the container end walls to protect the contents of the container from the weather while still permitting the closure lid to be pivotally moved aside by cattle seeking access to the contents of the container.

5,003,927

DEMAND TYPE ANIMAL WATERING VALVE

Earl C. Thompson, P.O. Box 549, Hewitt, Tex. 76643

Continuation-in-part of Ser. No. 159,382, Feb. 23, 1988, abandoned. This application Dec. 7, 1988, Ser. No. 280,833
Int. Cl.[5] A01K *7/00*
U.S. Cl. 119—72.5 **29 Claims**

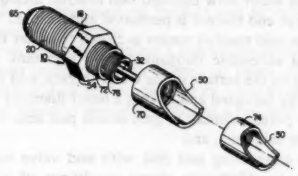
1. In a demand operable watering valve for animals including:

a tubular body in which the operative components, of the valve are supported, said body being of a first composition defining an inlet end communicating with a flow passage and adapted for connection to a water supply conduit;

a gasket positioned about said flow passage internally of said body; and

operating means supported within said body and cooperating with said gasket to be positionable in a first relation engaging said gasket to prevent water flow outward of said body and to be positionable in a second relation at least partially removed from said gasket to permit water flow received at said inlet end to be dispensed outward of said body;

said operating means including an elongated actuator stem extending from its support within said body to outward of said body and displaceable from a distal end for changing



the position of the operating means between said first and second relations; the improvement comprising:

a relatively short length of a sleeved mouthguard comprising a component separate and functionally independent of said body but secured to the outlet end of said body for protecting a valve portion thereat while exposing the distal end of said stem for potential mouth actuated displacement of said stem by an animal for whom the water is to be demanded;

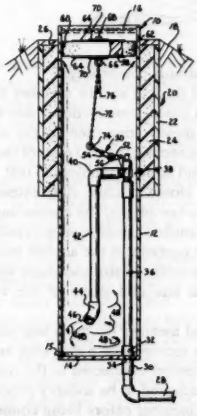
said mouthguard being of a second composition having hardness properties significantly greater than the hardness properties of said first composition and having a bulk relatively less than the bulk of said first composition.

5,003,928

FREEZE RESISTANT ANIMAL WATERING INSTALLATION

William S. Ketterlin, Rt. 10, Box 322, Columbia, Mo. 65201, and Robert F. Jurgensmeyer, 2712 Surfside Ct., Columbia, Mo. 65203

Filed Nov. 13, 1989, Ser. No. 434,337
Int. Cl.[5] A01K *7/04*
U.S. Cl. 119—73 **9 Claims**



6. An animal watering installation comprising:

a substantially cylindrical tank having an open top and a

closed bottom, said tank being buried in the ground with the longitudinal axis of said tank oriented generally vertically and with said open top of said tank accessible to animals at ground level;

a thermally insulating collar surrounding an upper portion of said tank;

conduit means adapted to be connected with a source of water and extending into said tank to supply incoming water thereto, said conduit means having a discharge end located within a lower portion of said tank for discharging the incoming water into said tank;

float operated valve means having an open condition wherein water flow through said conduit means and said discharge end thereof is permitted and a closed condition wherein said conduit means is closed to water flow;

an animal accessible buoyant disk in said tank normally floating on the surface of the water therein, said disk being thermally insulated and having a lesser diameter than said tank to permit animals to gain access past said disk to the water in said tank; and

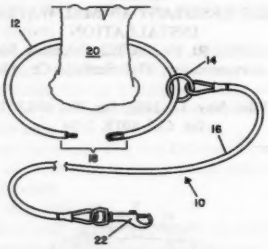
a linkage connecting said disk with said valve means in a manner to effect said closed conditions of said valve means when the float is above a preselected level in the tank and said open condition of said vale means when said float is below a preselected level in said tank.

5,003,929

TANGLE RESISTANT PET TIE APPARATUS AND METHOD

Grant Dean, Marble Falls, Tex., assignor to Ul-Tie-Mate Products, Inc., Marble Falls, Tex.

Filed Feb. 27, 1990, Ser. No. 485,977
Int. Cl.[5] A01K *3/00*
U.S. Cl. 119—120 **7 Claims**



1. A pet tie apparatus comprising:

(a) an elongated flexible anchor member having a substantially uniform outer cross-sectional size and shape;

(b) connecting means connected to the elongated anchor member of connecting the two ends of the anchor member together around an anchor object so that the anchor member forms a closed anchor ring extending completely around the anchor object, the connecting means forming an elongated anchor connection generally axially aligned with adjacent portions of the anchor member and having an outer cross-sectional size and shape similar to the outer cross-sectional size and shape of the elongated anchor member;

(c) a flexible lead member having a lead end to which a pet collar may be secured and a ring end; and

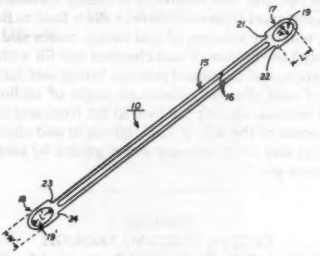
(d) a slip ring member connected to the ring end of the lead member and adapted to be slidably received on the elongated anchor member before being connected to form the closed anchor ring so that the slip ring may slide along the length of the closed anchor ring.

5,003,930

ANIMAL TRAINING COLLAR

Michael R. Shields, 1702 Three Meadows Rd., Greensboro, N.C. 27408

Filed Apr. 23, 1990, Ser. No. 513,067
Int. Cl.[5] A01K *27/00*
U.S. Cl. 119—106 **18 Claims**



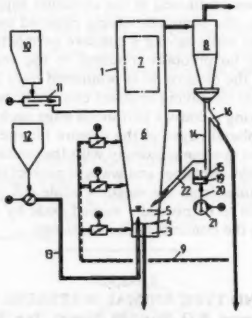
1. An animal training collar comprising: a flexible neck encircling band, said band comprising a plurality of elongated rods, a band receiver, said receiver connected to said band for slidably engaging one end of said band to form a noose, said band having sufficient memory whereby said band will resist efforts to close said noose and said noose will return to a substantially fully open configuration when the effort to close said noose is terminated.

5,003,931

METHOD OF AND DEVICE FOR MAINTAINING A PARAMETER CONSTANT IN A FLUIDIZED-BED FURNACE

Helmuth Huschauer, Neuss, Fed. Rep. of Germany, assignor to Vereinigte Kesselwerke AG, Düsseldorf, Fed. Rep. of Germany

Filed Sep. 29, 1989, Ser. No. 414,902
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1988, 3833489
Int. Cl.[5] B09B *3/00*
U.S. Cl. 122—4 D **4 Claims**



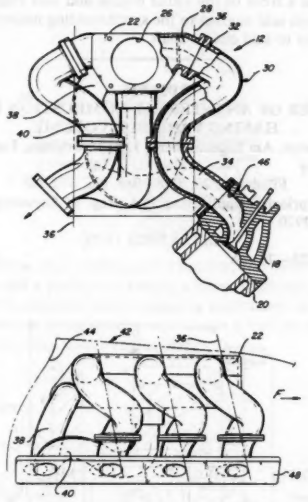
1. A method for maintaining a parameter constant in a fluidized-bed furnace, comprising the steps: supplying solids through a trap; supplying a fluidizing gaseous medium to said trap; fluidizing said solids by said gaseous medium; measuring said parameter; adjusting the volume of said gaseous medium dependent on said measuring step for increasing the volume of said gaseous medium when the parameter measured exceeds a predetermined magnitude and decreasing the volume of said gaseous medium when the parameter measured is below said predetermined magnitude.

5,003,932

INTAKE MANIFOLD

Harold D. Duncan, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 26, 1990, Ser. No. 558,280
Int. Cl.[5] F02M *35/10*
U.S. Cl. 123—52 MB 15 Claims



1. A low profile ram-tube intake manifold for an internal combustion engine having a plurality of intake ports, said intake manifold comprising:

an elongated plenum having an inlet and a plurality of outlets spaced along the length thereof; and

a plurality of substantially symmetrical tubular spiral runners, each having one end communicating with a plenum outlet, and the other end adapted to be attached to an intake port, each of said spiral runners spiraling about an axis at a substantially uniform radius and advancing therealong at a substantially uniform pitch to provide a low manifold profile having a minimal uniform flow resistance for a given runner length, cross-sectional area, and available space.

5,003,933

INTEGRATED INDUCTION SYSTEM

William B. Rush, II, Clarkston; Jack E. Elder, Rochester; Richard K. Shier, Livonia; Jerry B. Foss, Farmington Hills, all of Mich.; Karl J. Haltiner, Jr., Pittsford, and Grant M. Wheeler, Rochester, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 6, 1989, Ser. No. 432,295
Int. Cl.[5] F02M *35/10*
U.S. Cl. 123—52 MC 20 Claims

20. An integrated induction system to provide fluids to the cylinders in an engine, comprising:

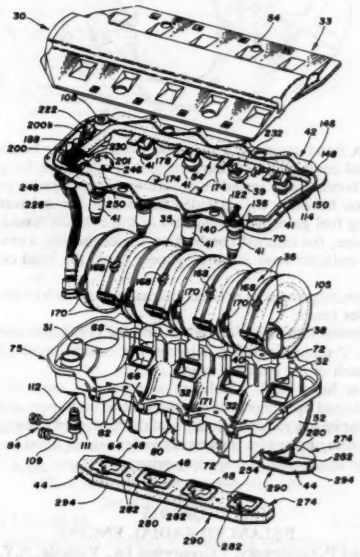
a casing adapted for mounting on the engine, said casing including a plurality of casing members held, together by connecting bolts extending through connecting bores in said casing members, said casing having an air inlet and a plurality of fluid outlets, each of said fluid outlets being adapted to communicate with a respective cylinder;

a plurality of resilient spring clips fixed to each of said connecting bolts and engageable with one of said casing members to hold said casing members together when the pressure inside said casing is below a predetermined limit and to allow said casing members to separate when the pressure inside said casing reaches or exceeds said predetermined limit;

a plurality of air tubes disposed within said casing, said air tubes occupying a portion of the interior of said casing with the unoccupied portion of said casing constituting a plenum, said air tubes being positioned within said casing so that said plenum provides a flow path from said air inlet to said air tubes, one end of each of said air tubes opening from said plenum and the other end of said air tubes engaging said casing adjacent a respective fluid outlet to allow communication between said plenum and the cylinders so that air entering into said plenum through said air inlet is introduced via each of said air tubes into the respective cylinders;

a locator system including a locator tab projecting from the outer surface of each of said air tubes into engagement with said casing to hold said air tubes in said casing;

a fuel injection assembly including a fuel distribution assembly connected to a fuel source, and a fuel injector corresponding to each fluid outlet, said fuel distribution assembly including an injector pod connected to each of said fuel injectors enabling communication between said fuel injectors and the fuel source, said injector pods being mounted on said casing so that each of said fuel injectors is adjacent one of said fluid outlets to facilitate injection of fuel into the air exiting said air tubes adjacent said fluid outlets to cause a mixture of air and fuel to enter the respective cylinders;



a carrier connected to said fuel distribution assembly;

a sensor connected to said carrier to measure the condition of the air inside said casing: and

a distribution mounting disposed between said casing adjacent said fluid outlets, and the engine adjacent the cylinder inlets, said distribution mounting having passages to allow communication between air and fuel contained within said casing and the cylinders, and to allow communication between a supplemental fluid source and the cylinders.

5,003,934

HOOD COVERING THE SPACE BETWEEN CYLINDER BANKS OF AN INTERNAL-COMBUSTION ENGINE WHICH ARE ARRANGED IN A V-SHAPE

Peter Gubon, Lindau; Hans Sudmanns, and Christoph Teetz, both of Friedrichsafen, all of Fed. Rep. of Germany, assignors to MTU Friedrichshafen GmbH, Friedrichshafen, Fed. Rep. of Germany

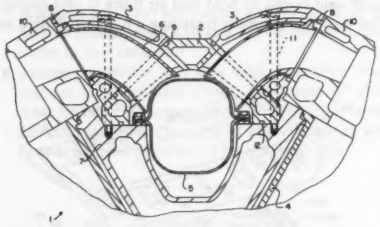
PCT No. PCT/DE89/00404, § 371 Date Mar. 13, 1990, § 102(e) Date Mar. 13, 1990, PCT Pub. No. WO90/00673, PCT Pub. Date Jan. 25, 1990

PCT Filed Jun. 19, 1989, Ser. No. 490,660

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1988, 3823685

Int. Cl.[5] F02M *35/10*

U.S. Cl. 123—52 MV 6 Claims



1. A hood covering a space between cylinder banks of an internal combustion engine arranged in a V-shape for providing a hermetically sealed enclosure for a ram pipe arranged in an area between the cylinder banks and for exhaust pipes leading fuel gases from cylinders of the cylinder banks to the ram pipe, the internal combustion engine having a crankcase and a cylinder head at each cylinder bank, the head comprising:

contacting surfaces at the crankcase and at each of the cylinder heads;

a central hood part which rests on the crankcase and forms a V-shaped opening between the central hood part and each of the cylinder heads;

outer hood parts which are wedged into each of the V-shaped openings between the central hood part and cylinder heads, to hermetically seal the V-shaped openings; and

fastening means for pulling each of the outer hood parts into an associated V-shaped opening.

5,003,935

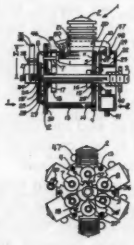
BALANCED RADIAL ENGINE

Michael P. Goldowsky, 7 Greenwood La., Valhalla, N.Y. 10595

Filed Nov. 28, 1988, Ser. No. 276,943

Int. Cl.[5] F02B *75/22*

U.S. Cl. 123—55 R 10 Claims



1. An internal combustion radial engine composed of an even number of identical and fully functional single cylinder slider crank 2-cycle or 4-cycle engines, each engine comprising a piston, linkage means, carburetor means, and shaft, said engines being positioned in pairs in a common plane, said pistons are in line and diametrally opposed, said engine shafts are parallel to one another and to a central output shaft and having synchronizing means positioned on said engine shafts for coupling said engine shafts to the output shaft whereby diametrally opposite pistons radially move in phase synchronism thereby cancelling all piston and linkage means inertial forces, said output shaft projects from said synchronizing means past a front of the radial engine and said engine shafts project from said engines to the synchronizing means opposite in direction to said output shaft.

5,003,936

CYLINDER OF AN INTERNAL COMBUSTION ENGINE HAVING VARIABLE VOLUME

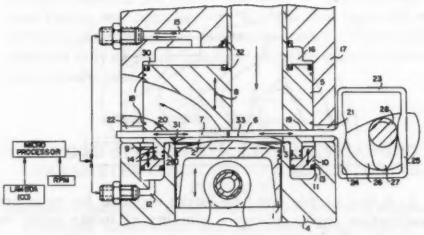
Peter Scherer, Am Zigeunerbergl 1, 8104 Grainau, Fed. Rep. of Germany

Filed Jan. 29, 1990, Ser. No. 472,368

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1989, 3902920

Int. Cl.[5] F02B *19/00*

U.S. Cl. 123—78 AA 19 Claims



1. In a cylinder of an internal combustion engine comprising a cylinder head having a bore formed therein, a correspondingly shaped insert defining a cylinder chamber arranged in said bore, said insert being sealed by means of ring seals relative to said bore and being movable to alter the volume of the cylinder, the improvement comprising sensing means for continuously measuring the carbon monoxide content of the exhaust from the engine, means for continuously measuring the speed of the engine, and microprocessor means for controlling movement of the cylinder insert, said microprocessor means being responsive to said sensing means to adjust the volume of said cylinder for maximum efficiency at a given engine speed.

5,003,937

VALVE OPERATING SYSTEM FOR INTERNAL COMBUSTION ENGINE

Yukihiro Matsumoto; Kenji Yoshihara; Tetsuya Kajiura; Tomonori Niizato, and Noriyuki Yamada, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1989, Ser. No. 388,123

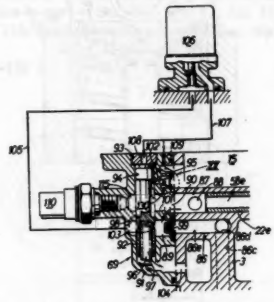
Claims priority, application Japan, Aug. 1, 1988, 63-102101[U]; Oct. 11, 1988, 63-13244[U]

Int. Cl.[5] F01L *1/34, 9/02*

U.S. Cl. 123—90.12 20 Claims

1. A valve operating system for an internal combustion engine, including a valve operation mode changing mechanism capable of changing at least one of either the lift amount of opening of an engine valve openably and closably carried in an engine body or the opening or closing timing in accordance with a variation in hydraulic pressure supplied to the changing mechanism, and a selector valve including a valve element slidably received in a housing attached to the engine body to change the supply of hydraulic pressure to the valve operation

mode changing mechanism, wherein the housing of the selector valve is provided with a working oil chamber in communication with the valve element for driving the valve element, toward a position to supply a higher hydraulic pressure to the valve operation mode changing mechanism upon an increase in



oil pressure in said working oil chamber, the valve element biased toward a position to supply a lower hydraulic pressure to the valve operation mode changing mechanism, said working oil chamber being connected through a leak jet to a drain chamber provided in the engine body.

5,003,938

PNEUMATICALLY POWERED VALVE ACTUATOR

Frederick L. Erickson, and William E. Richeson, Jr., both of Fort Wayne, Ind., assignors to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Filed Dec. 26, 1989, Ser. No. 457,014

Int. Cl.[5] F01L *9/00*

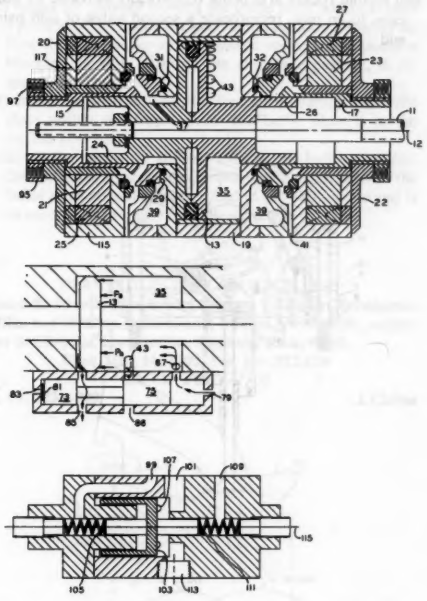
U.S. Cl. 123—90.14 **20 Claims**

6. An electronically controllable pneumatically powered valve actuating mechanism for use in an internal combustion engine of the type having engine intake and exhaust valves with elongated valve stems, the actuator comprising:

a power piston reciprocable along an axis and adapted to be coupled to an engine valve;

pneumatic motive means for moving the piston, thereby causing an engine valve to move in the direction of stem elongation between valve-open and valve-closed positions, the pneumatic motive means including a pair of control valves movable relative to the piston for selectively supplying high pressure air to the piston; and

pneumatic damping means for imparting a first decelerating force to the piston when the engine valve reaches a first separation from one of said valve-open and valve-closed positions to begin reducing engine valve velocity as the engine valve approaches said one position, and for imparting a second lesser decelerating force to the piston when



the engine valve reaches a second lesser separation from said one position.

5,003,939

VALVE DURATION AND LIFT VARIATOR FOR INTERNAL COMBUSTION ENGINES

Brian T. King, 48000 Elkview Rd., RR #2, Sardis, B.C., Canada

Filed Feb. 26, 1990, Ser. No. 486,599

Int. Cl.[5] F01L *1/34*

U.S. Cl. 123—90.16 **8 Claims**

1. A mechanism to variably combine the durations of a pair of valves jointly associated functionally with one of a process of induction and exhaust within the combustion chamber of an Internal Combustion engine having a crankshaft, so as to vary, relative to crankshaft revolution, the duration of said one of a process of induction and exhaust associated functionally with said pair of valves, said mechanism comprising:

a camshaft;

said camshaft having at least two cams;

a first housing fixed relative to said engine;

a first drum rotatably embraced by said first housing, said first drum being of common axis with said camshaft, the periphery of said first drum being interposed between one of said cams and said first housing;

a first rocker arm having a fulcrum end for rotation about a pivot fixed within said drum, and a free end capable of substantially reciprocal motion;

said first rocker arm being reciprocally movable by said cam, to in turn, reciprocate a first valve of said pair;

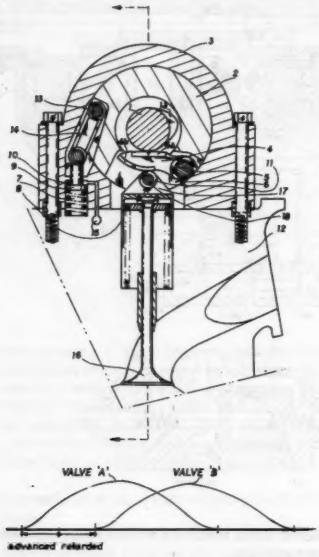
a second housing fixed relative to said engine;

a second drum rotatably embraced by said second housing, said second drum being of common axis with said cam-

shaft, the periphery of said second drum being interposed between another of said cams and said second housing;

a second rocker arm having a fulcrum end for rotation about a pivot fixed within said second drum, and a free end capable of substantially reciprocal motion;

said second rocker arm being reciprocally movable by said cam, to, in turn, reciprocate a second valve of said pair; and



means to rotate said first and said second drums relative to each other, for varying the phasing of said first valve relative to the phasing of said second valve, so as to variably combine the duration of said first valve associated functionally with said first drum, and the duration of said second valve associated functionally with said second drum;

said variably combined durations of said pair of valves varying the duration of said one of a process of induction and exhaust associated functionally with said pair of valves.

5,003,940

QUICK ADJUST TAPPET ASSEMBLY

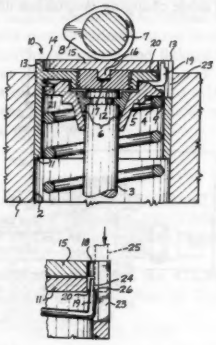
William J. Hixson, 4220 NE. 90th, Seattle, Wash. 98115

Filed Jul. 25, 1990, Ser. No. 557,875

Int. Cl.[5] F01L *1/14, 1/20*

U.S. Cl. 123—90.54 **10 Claims**

1. In a tappet assembly interposed between a valve stem and a cam shaft of an engine and including a follower member having a threaded bore in alignment with the valve stem, a threaded plug member received in such bore, a cap member overlying and interconnected with the plug member such that turning the cap member turns the plug member to move it axially of the valve stem for adjusting the effective thickness of the tappet assembly, such cap member having an outer periphery concentric with such bore, and locking means for normally preventing rotation of the cap member relative to the follower member, the improvement comprising the cap member having an outward-opening peripheral notch, and the locking means



including a locking pin nonrotative relative to the follower member and normally received in said notch.

5,003,941

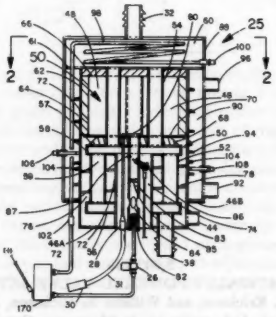
ENGINE HEATING UNIT

Roy R. Jeffrey, Jr., 1706 Ellison St., and John Devoss, 801 Floydada St., both of Wellington, Tex. 79095

Filed Jun. 4, 1990, Ser. No. 532,742

Int. Cl.[5] F02M *17/02*

U.S. Cl. 123—142.5 R **35 Claims**



1. Apparatus for heating a liquid cooled internal combustion engine comprising:

a vertical fire-box having inlet and exhaust flow paths, said exhaust flow path extending downwardly from said fire-box;

a refractory lining for said fire-box;

combustion means for producing radiant energy and hot gaseous combustion products in said fire-box inlet flow path so as to heat said refractory lining to incandescence;

first engine coolant heat exchanging means positioned in said exhaust flow path for cooling said combustion products;

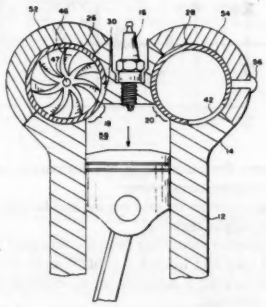
first connecting means for passing liquid coolant from said engine through said first engine coolant heat exchanging means;

second engine coolant heat exchanging means above said first engine coolant heat exchanging means, cooperating with said combustion means and said incandescent fire-box for heating said engine coolant;

second connecting means for passing liquid coolant from said first engine coolant heat exchanging means through said second engine coolant heat exchanging means; and

third connecting means for returning liquid coolant from said second coolant heat exchanging means to said engine.

5,003,942
ROTARY VANED VALVES
Gregory R. Hansard, 7045 Toma La., Penngrove, Calif. 94951
Continuation-in-part of Ser. No. 383,732, Jul. 21, 1989, abandoned. This application May 1, 1990, Ser. No. 517,292
Int. Cl.[5] F01L *7/00*
U.S. Cl. 123—190 A **10 Claims**

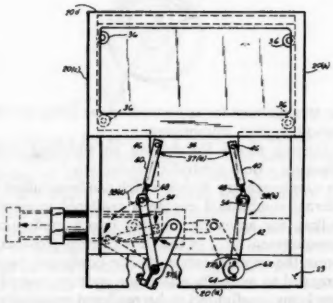


1. A rotary valve for an internal combustion engine having an intake head surface bearing a plurality of cylinder intake ports and an exhaust head surface bearing a plurality of cylinder exhaust ports, said rotary valve having a tubular-shaped body member having a longitudinal axis and a plurality of circumferentially staggered valve ports conditioned to enable gas flow through said valve, said rotary valve including drive means for rotating said body member about said longitudinal axis, the improvement comprising:

a set of vanes independently mounted inside said rotary valve body member; and

vane drive means for rotating said vanes within said rotary valve body member, wherein when said rotary valve body member rotates, said vanes independently rotate at a greater rotational speed to enhance gas flow through said rotary valve.

5,003,943
ENGINE AIR INTAKE SHUTOFF APPARATUS
Theodore B. Lafferty, Sr., 303 Fabiola Ave., Lafayette, La. 70508
Filed May 26, 1989, Ser. No. 358,068
Int. Cl.[5] F02B *77/00*
U.S. Cl. 123—198 D **16 Claims**



1. Apparatus including an engine air intake shutoff device and an engine air intake structure having an air intake passage, the device comprising:

(a) a frame mounted on the air intake structure for supporting movement of a baffle plate;

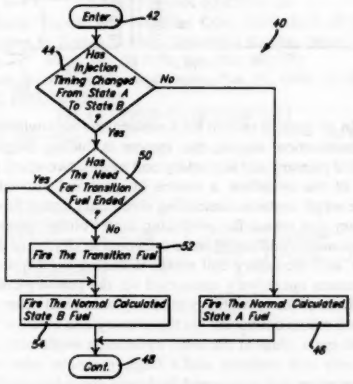
(b) a baffle plate moveable over the air intake passage within at least a portion of the frame;

(c) means for slidably moving the baffle plate within at least a portion of the frame between a first position allowing air flow through the air intake passage and a second position blocking air flow through the air intake passage, in response to a signal;

(d) means associated with the frame for sealing the baffle plate within the frame when the baffle plate is in the second position,

wherein the means for slidably moving the baffle plate further includes a pair of retractable baffle arms, each of the baffle arms affixed at its first end to the baffle plate and at its second end to an operating shaft.

5,003,944
TRANSITION FUEL MULTIPLIER
Richard K. Moote, Ann Arbor; Gregory T. Weber, Farmington Hills, and William O. Robinson, Detroit, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.
Filed May 14, 1990, Ser. No. 522,624
Int. Cl.[5] F02D *41/04*
U.S. Cl. 123—299 **2 Claims**



1. In a fuel injection system for an engine of an automotive vehicle including a plurality of cylinders, a spark plug for each of the plurality of cylinders, a distributor electrically connected to the spark plug, a throttle body having a throttle valve connected to the engine to allow or prevent air to the plurality of cylinders, a fuel source, at least one fuel line connected to the fuel source, a plurality of fuel injectors connected to the fuel line for delivering fuel to the plurality of cylinders, a sensor located near the distributor for sensing predetermined states of the distributor (A and B), and an electronic control unit (ECU) electrically connected to the sensor, distributor and fuel injectors for receiving signals from the sensor and outputting signals to fire the distributor and fuel injectors, a method of firing the fuel injectors, said method comprising the steps of:

determining whether injection timing for firing the fuel injectors has changed from predetermined state A to predetermined state B of a distributor reference signal;

firing the fuel injectors for a predetermined time period and delivering a calculated amount of fuel at predetermined state A if injection timing has not changed;

determining whether a need for transition fuel has ended if injection timing has changed;

firing the fuel injectors for another predetermined time period and delivering a calculated amount of transition fuel at predetermined state B if the need for transition fuel has not ended; and

firing the fuel injectors for another predetermined time period and delivering a calculated amount of fuel at the predetermined state B if either said firing of transition fuel has been completed or if the need for transition fuel has ended.

5,003,945

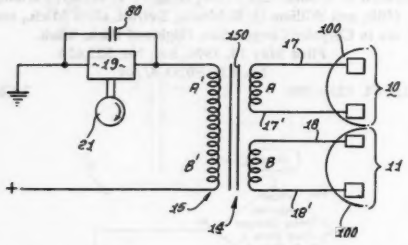
DUAL SPARK PLUG IGNITION SYSTEM FOR MOTORCYCLE INTERNAL COMBUSTION ENGINE

Herbert W. Hoeptner, Morgan Hill, Calif., assignor to Custom Chrome, Inc., Morgan Hill, Calif.

Filed Sep. 28, 1989, Ser. No. 413,337

Int. Cl.[5] F02P *15/02*

U.S. Cl. 123—310 **1 Claim**



1. In an ignition system for a motorcycle two cylinder internal combustion engine, the system including magnetically coupled primary and secondary coil means, two spark plugs at each of the cylinders, a source of electrical current, and a single set of contacts controlling electrical current flow to the primary coil means for producing high voltage outputs from the secondary coil means to be delivered to all four of the spark plugs, said secondary coil means including certain secondary coil means operatively connected via the primary coil means with both of the spark plugs at one cylinder, and other secondary coil means connected via the primary coil means with both of said spark plugs at the other cylinder, a single cam controlling only said contacts, and a single magnetic core between said primary coil means and both said secondary coil means, and wherein said spark plugs include:

two plugs at one cylinder and connected with said certain secondary coil means,

two plugs at the second cylinder and connected with said other secondary coil means,

said primary coil means including certain primary coil means magnetically coupled to said certain secondary coil means, and other primary coil means magnetically coupled to said other secondary coil means, said certain and other primary coil means being connected in series, electrically, said two spark plugs at one cylinder being electrically connected to opposite ends of said certain secondary coil means, and said two spark plugs at the other cylinder are electrically connected to opposite ends of said other secondary coil means, and including

(a) said cam driven by the engine for controlling opening of the contacts, the cam rotatable about a first axis,

(b) carrier means carrying the contacts, and adjustably rotatable about said axis,

(c) and non-rotary support means to which said carrier means is connected, in adjusted position of the contacts,

(d) whereby the timing of spark effected ignitions by all the spark plugs may be simultaneously controlled.

5,003,946

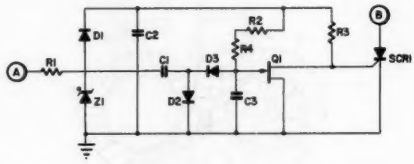
ENGINE SPARK CONTROL APPARATUS

Floyd M. Minks, 2700 Partin Settlement Rd., Kissimmee, Fla. 32743

Division of Ser. No. 226,298, Jul. 7, 1988, Pat. No. 4,821,702, which is a continuation of Ser. No. 112,100, Oct. 22, 1987, Pat. No. 4,774,924. This application Apr. 12, 1989, Ser. No. 337,014

Int. Cl.[5] F02P *5/155*

U.S. Cl. 123—335 **7 Claims**



1. A system for controlling the formation of a spark in a combustion engine comprising:

an alternator driven by said engine and having an alternating current output terminal;

a semiconductor switching device connected to said ignition control lead and having a control input terminal;

a network having a network input terminal and a network output terminal;

means connecting said network input terminal to said alternating current output terminal and said network output terminal to said control input terminal so that said ignition system is disabled above a selected engine speed; and

a frequency sensitive control network containing a frequency-to-current converter with means to minimize the effect of changes in the output of said converter caused by changes of voltage of said alternating current output terminal.

5,003,947

ARRANGEMENT FOR APPORTIONING THE IDLING AIR OF INTERNAL-COMBUSTION ENGINES

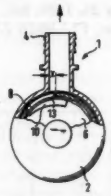
Heinz Lemberger, Unterföhring, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany

Filed Mar. 21, 1990, Ser. No. 496,935

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1989, 3909396

Int. Cl.[5] F02M *3/00*

U.S. Cl. 123—339 **5 Claims**



1. An arrangement for apportioning the idling air of internal-combustion engines, comprising:

an adjusting motor for driving an adjusting member for changing a flow control cross-section,

and a supplementary device which can be actuated when the internal-combustion engine is rendered inoperative controlling the adjusting member into a minimum opening (measurement "x") of the flow control cross-section,

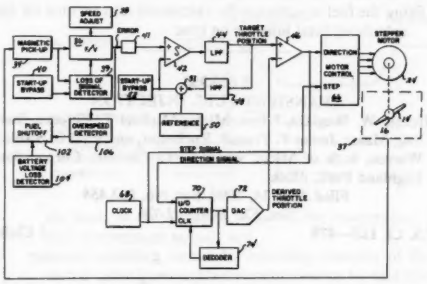
wherein the supplementary device comprises two magnets arranged to mutually affect one another, one of the magnets being configured to be rendered essentially inoperative when the internal-combustion engine is operating.

5,003,948

STEPPER MOTOR THROTTLE CONTROLLER

Jonathan D. Churchill, and William T. Volmary, both of Sheboygan, Wis., assignors to Kohler Co., Kohler, Wis.

Filed Jun. 14, 1990, Ser. No. 538,289
Int. Cl.[5] F02D *11/10, 31/00*
U.S. Cl. 123—352 **8 Claims**



1. In an engine regulator for an internal combustion engine having a stepper motor for controlling the flow rate of air and fuel in response to a electric control signal, a controller for providing step pulses to the stepper motor in response to the electric control signal, the controller comprising:

an oscillator for producing a periodic clock signal;

a sequencer for receiving a direction and the clock signal for producing step pulses for moving the stepper motor in a direction for a predetermined number of steps;

an up/down counter for receiving the direction and clock signals and producing a digital word updated in the direction indicated by the direction signal and in amount by a number indicated by the clock signal; and

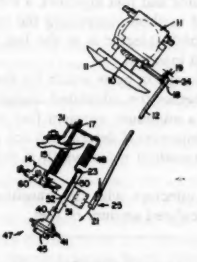
a comparator for comparing the digital word to the electric control signal and producing the direction signal.

5,003,949

GOVERNOR ASSIST MECHANISM

John C. Fanner, Coon Rapids, and Nick V. Halstead, Oak Grove, both of Minn., assignors to Onan Corporation, Minneapolis, Minn.

Filed Apr. 21, 1989, Ser. No. 341,644
Int. Cl.[5] F02D *7/00*
U.S. Cl. 123—382 **16 Claims**



1. An apparatus for assisting a primary governor device on an engine having an intake manifold, said primary governor device being of the type having a control arm and a primary governor arm which control opening and closing of a throttle device, said governor assist apparatus comprising:

(a) an assist spring operatively interconnected to said control arm by linkage means, wherein said linkage means comprises an intermediate link having a first and second end, said first end being interconnected to said assist spring, said intermediate link having a longitudinal slot therein which accommodates the primary governor arm, wherein movement of said intermediate link causes movement of the primary governor arm;

(b) means for disengaging said assist spring with respect to said primary governor device, said disengagement means including:

(i) a vacuum capsule having a first and second chamber, said first chamber being at atmospheric pressure and said second chamber being in fluid communication with the intake manifold so as to have the same pressure as the intake manifold, said first and second chambers being divided by a movable diaphragm; and

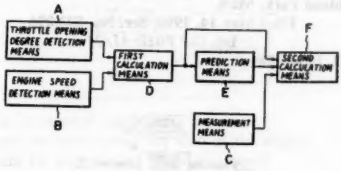
(ii) a diaphragm plunger interconnected to said diaphragm, one end of said diaphragm plunger being operatively interconnected to said assist spring so as to control movement thereof, wherein said ends of said intermediate link are interconnected to said assist spring and said diaphragm plunger by means of hook connections.

5,003,950

APPARATUS FOR CONTROL AND INTAKE AIR AMOUNT PREDICTION IN AN INTERNAL COMBUSTION ENGINE

Senji Kato, Totota, and Hidehiro Oba, Aichi, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jun. 7, 1989, Ser. No. 362,770
Claims priority, application Japan, Jun. 15, 1988, 63-147850; Jul. 30, 1988, 63-191153
Int. Cl.[5] F02D *41/18;* **F02P** *5/15*
U.S. Cl. 123—422 **24 Claims**



1. An internal combustion engine control apparatus, comprising:

a first detection means for detecting a degree of throttle opening;

a second detection means for detecting an engine speed;

measurement means for measuring a value of one of an amount of intake air taken into the combustion chamber and a physical quantity corresponding to the intake air amount;

prediction means which calculates an intake pipe pressure for a constant state, on the basis of a current degree of throttle opening and a current engine speed, and uses said intake pipe pressure and a constant status to predict a value for a future point in time a certain period in advance of a current time, of one of the amount of intake air taken into the combustion chamber and a physical quantity corresponding to the intake air amount;

a correction means for using the value measured by said measurement means to correct the value predicted by said prediction means; and

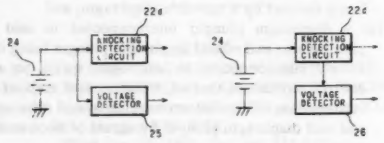
a control means for controlling one or both of the fuel injection duration and the spark timing, on the basis of the corrected predicted value and the engine speed.

5,003,951

CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

Satosi Komurasaki, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 6, 1990, Ser. No. 490,897
Claims priority, application Japan, Mar. 7, 1989, 1-52923
Int. Cl.[5] F02D *41/22*; F02P *5/15*
U.S. Cl. 123—425 4 Claims



1. A control apparatus for an internal combustion engine having a microcomputer for running control of the internal combustion engine according to running information of the internal combustion engine and a signal obtained by processing said running information, comprising:

a signal processing circuit which has a higher operating voltage than that of said microcomputer and which supplies said signal to said microcomputer; and

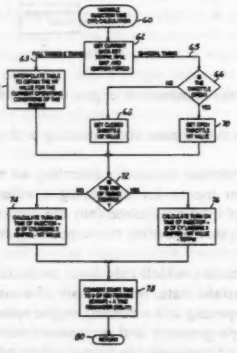
control level change means for lowering the control level in response to an output of said signal processing circuit when the voltage of said signal processing circuit is lower than a predetermined value, wherein said signal processing circuit is a circuit for detecting knocking of the internal combustion engine.

5,003,952

SEQUENTIAL VARIABLE FUEL INJECTION

Michael W. Weglarz, Utica, Mich.; Michael T. Vincent, Sterling, Mass.; James F. Prestel, Rochester, and Paul G. Sisoler, Warren, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed May 14, 1990, Ser. No. 523,094
Int. Cl.[5] F02D *41/04*
U.S. Cl. 123—478 1 Claim



1. In a fuel injection system for an engine of an automotive vehicle including a plurality of cylinders, a spark plug for each of the plurality of cylinders, a distributor electrically connected to the spark plug, a throttle body having a throttle valve connected to the engine to allow or prevent air to the plurality of cylinders, a fuel source at least one fuel line connected to the fuel source, a plurality of fuel injectors connected to the fuel line for delivering fuel to the plurality of cylinders, a sensor located near the distributor for sensing predetermined states of the distributor, and an electronic control unit (ECU) electrically connected to the sensor, distributor and fuel injectors for receiving signals from the sensor and outputting signals to fire the distributor and fuel injectors, a method of firing the fuel injectors, said method comprising the steps of:

calculating a desired total injector on time for current engine conditions;

calculating a variable injection time (VIT) and a turn on time based on the VIT; and

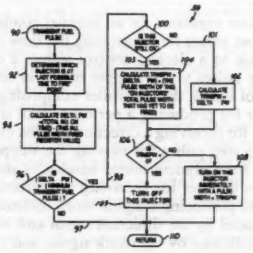
firing the fuel injectors at the calculated turn on time for the calculated total injector on time.

5,003,953

TRANSIENT FUEL INJECTION

Michael W. Weglarz, Utica, Mich.; Michael T. Vincent, Sterling, Mass.; James F. Prestel, Rochester, and Paul G. Sisoler, Warren, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed May 14, 1990, Ser. No. 523,454
Int. Cl.[5] F02D *41/04*
U.S. Cl. 123—478 1 Claim



1. In a fuel injection system for an engine of an automotive vehicle including a plurality of cylinders, a spark plug for each of the plurality of cylinders, a distributor electrically connected to the spark plug, a throttle body having a throttle valve connected to the engine to allow or prevent air to the plurality of cylinders, a fuel source, at least one fuel line connected to the fuel source, a plurality of fuel injectors connected to the fuel line for delivering fuel to the plurality of cylinders, a sensor located near the distributor for sensing predetermined states of the distributor, and an electronic control unit (ECU) electrically connected to the sensor, distributor and fuel injectors for receiving signals from the sensor and outputting signals to fire the distributor and fuel injectors, a method of firing the fuel injectors, said method comprising the steps of:

determining which injector is at the last possible time for firing the fuel injector;

calculating a change in pulse width for the fuel injector;

determining whether the calculated change in pulse width is greater than a minimum transient fuel pulse;

firing the fuel injectors if determined not greater;

calculating a transition pulse width if determined greater; and

firing the fuel injectors with the transition pulse width to deliver a calculated amount of fuel.

5,003,954

FAIL-SAFE DEVICE FOR TEMPERATURE SENSORS

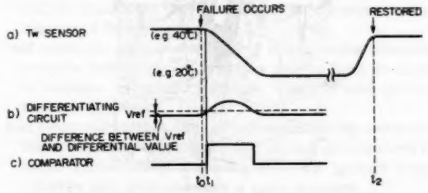
Masahiko Yakuwa; Tomofumi Itoh, and Hisashi Igarashi, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1989, Ser. No. 411,397
Claims priority, application Japan, Sep. 22, 1988, 63-237866
Int. Cl.[5] F02D *41/22*
U.S. Cl. 123—479 9 Claims

1. A fail-safe device for a temperature sensor for detecting a temperature of an internal combustion engine, comprising:

renewal means for renewing a value of the temperature of said engine detected by said temperature sensor and storing the renewed value, the stored renewed value being applied to control of operation of said engine;

low temperature region detecting means for determining whether or not the temperature of said engine is in a low temperature region lower than a predetermined value, on



the basis of the detected value of the temperature from said temperature sensor; and

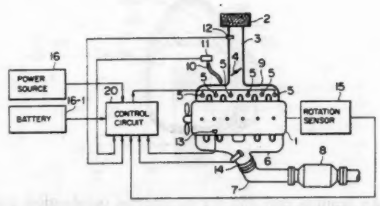
renewal inhibiting means for inhibiting renewal of the detected value from said temperature sensor by said renewal means when the detected value has decreases, while said low temperature region detecting means detects said low temperature region.

5,003,955

METHOD OF CONTROLLING AIR-FUEL RATIO

Hiroshi Haraguchi, Kariya, Japan; Hiroshi Tamura, Torrance, Calif.; Katuhiko Kodama, Obu, and Toshio Kondo, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 11, 1990, Ser. No. 463,438
Claims priority, application Japan, Jan. 20, 1989, 1-012529
Int. Cl.[5] F02D *41/14*
U.S. Cl. 123—489 **9 Claims**



1. A method of controlling the air fuel ratio in internal combustion engines of the type in which a transient correction value for correcting a base fuel quantity in an internal combustion engine in a transient state is corrected in accordance with a transient learning value determined on the basis of a signal supplied from an air-fuel-ratio sensor when the engine is in a transient state, thereby accurately adjusting the air-fuel ratio of a mixture supplied to the engine in a transient state to a target air-fuel, said method comprising the steps of:

updating first learning terms at a first learning speed in response to a signal from said air-fuel-ratio sensor and respectively storing them in a reloadable memory device, said first learning terms being provided for respective different ranges corresponding to different engine temperatures and related to factors causing variation in air-fuel ratio in such a manner that the air-fuel-ratio variate of the variation varies depending upon the engine temperature;

updating second learning terms at a second learning speed which is higher than said first learning speed is response to a signal from said air-fuel-ratio sensor and storing them in said reloadable memory device, said second learning terms being related to factors causing variation in air-fuel ratio in such a manner that the air-fuel-ratio variate of the variation varies in a substantially uniform manner with respect to the engine temperature; and

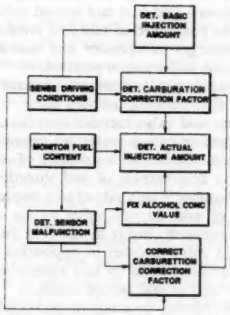
determining said transient learning value on the basis of said first learning terms dependent on the engine temperature and stored in said memory device and of said second learning terms stored in said memory device, and correcting said transient correction value in accordance with the transient learning value thus determined.

5,003,956

ELECTRONIC FUEL INJECTION CONTROL SYSTEM FOR A MULTI-FUEL INTERNAL COMBUSTION ENGINE AND METHOD THEREFORE

Akio Iwamoto, and Yoshiki Yuzuriha, both of Gunma, Japan, assignors to Japan Electronic Control Systems Co., Ltd., Isezaki, Japan

Filed Apr. 12, 1990, Ser. No. 507,845
Int. Cl.[5] F02M *51/00*
U.S. Cl. 123—494 **2 Claims**



1. In an internal combustion engine

means for determining the load on the engine;

means for determining the engine speed;

means for sensing the content of the fuel being supplied to the engine;

diagnostic means for monitoring the operation of fuel content sensing means and for indicating the fuel content sensing means is malfunctioning when the output characteristics vary in a predetermined manner;

means for determining a basic fuel supply amount based on the engine load and engine speed;

means deriving an actual fuel supply amount by correcting the basic fuel amount using a first correction factor based on the sensed content of the fuel and a second correction factor based on the load on the engine, the second correction factor being arranged to be set to a relatively high value when the load on the engine is above a predetermined level and said diagnostic means indicates that the fuel content sensing means is operating normally;

means for setting said first correction factor to a predetermined value upon said diagnostic means indicating said fuel content sensing means is malfunctioning; and

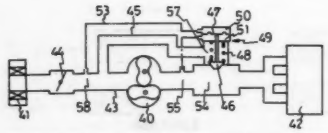
means for incrementally increasing said second second correction factor in lieu of setting said second correction factor to the relatively high value when said diagnostic means indicates that said fuel content sensing means is malfunctioning.

5,003,957

INTERNAL COMBUSTION ENGINE WITH A MECHANICAL SUPER-CHARGER

Toshio Takeda, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 23, 1989, Ser. No. 313,945
Claims priority, application Japan, Feb. 23, 1988, 63-38669
Int. Cl.[5] F02D *23/00*
U.S. Cl. 123—564 1 Claim



1. An internal combustion engine having a mechanical super-charger, comprising:

a first conduit connecting said engine with a source of air;

a super-charger compressor in said first conduit for compressing air in said first conduit;

a second conduit connected to said first conduit at positions at upstream and downstream sides of said super-charger compressor;

a pressure regulating valve including a valve member positionable in a closed position for fluidically closing communication between said first and second conduits;

a throttle valve positioned in said first conduit upstream of said super-charger compressor and movable between a closed position and an open position;

a diaphragm mechanically connected to said valve member and having first a fluid chamber;

a spring biasing said valve member into the closed position;

means for communicating under all operating conditions said first fluid chamber with a portion of said first conduit at a position downstream of said throttle, wherein said first fluid chamber is on a side of said diaphragm such that movement of said throttle valve to the closed position produces a pressure change in said first fluid chamber for opening said valve member in opposition to said spring, whereby air compressed by said super-charger compressor may be bled to said second conduit;

a second fluid chamber on a side of said diaphragm member opposite said first fluid chamber; and

means for communicating under all operating conditions said second fluid chamber with a portion of said first conduit downstream of said super-charger compressor,

whereby said valve member comprises both means for reducing a load on said super-charger compressor when said throttle valve is closed and means for limiting a maximum air pressure at the downstream side of said super-charger compressor.

5,003,958

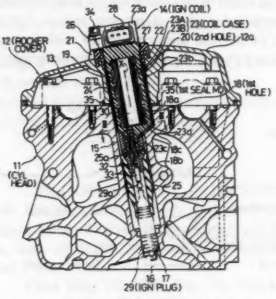
IGNITION COIL MOUNTING STRUCTURE FOR ENGINE

Syuichi Yoneyama; Yoshinori Obana, and Eiichi Fujisawa, all of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 27, 1989, Ser. No. 456,642
Claims priority, application Japan, Dec. 27, 1988, 63-168943[U]; Feb. 23, 1989, 1-43434
Int. Cl.[5] F02P *3/02*
U.S. Cl. 123—635 11 Claims

1. An ignition coil mounting structure for an engine, comprising:

(a) a cylinder head formed with a coil mounting hole including a first large-diameter inclined coil mounting hole, a second small-diameter inclined coil mounting hole, and an intermediate partially conical surface for connecting said first and second inclined coil mounting holes in axially eccentric positional relationship with respect to each other; and



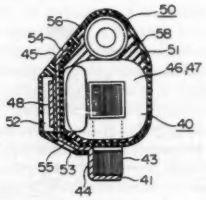
(b) an ignition coil formed with an outer casing so as to be inserted into the coil mounting hole formed in said cylinder head.

5,003,959

IGNITION COIL UNIT FOR AN INTERNAL COMBUSTION ENGINE

Tomokazu Umezaki, and Tadao Takaishi, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1989, Ser. No. 418,077
Claims priority, application Japan, Oct. 7, 1988, 63-252033; Oct. 13, 1988, 63-255831
The portion of the term of this patent subsequent to Aug. 28, 2007, has been disclaimed.
Int. Cl.[5] F02P *3/04;* H01F *31/00*
U.S. Cl. 123—647 7 Claims



1. An ignition coil unit for an internal combustion engine comprising:

a magnetic iron core;

a primary coil wound around said iron core;

a secondary coil electromagnetically coupled with said primary coil;

a control circuit for controlling a primary electric current flowing through said primary coil;

a single common case containing said iron core, said primary coil, said secondary coil and said control circuit therein; and a heat sink (32; 44) secured to and supported by said iron core.

5,003,960

ELECTRONIC GRILL CONTROL

Joseph J. Hanagan, Freeport, Ill., assignor to The Thermos Company, Inc., Freeport, Ill.

Division of Ser. No. 337,364, Apr. 13, 1989. This application Feb. 15, 1990, Ser. No. 480,303
Int. Cl.[5] F24C *3/08*
U.S. Cl. 126—39 BA 6 Claims

1. In a barbecue grill of the type employing a containment means with at least one burner disposed therein and an electri-

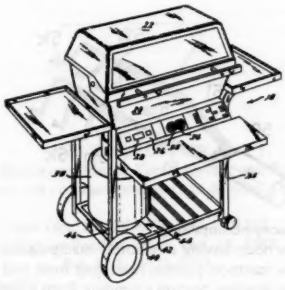
cally actuable means for igniting said burner, the improvement comprising:

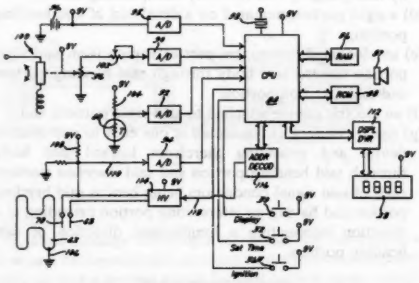
flame sensing means disposed adjacent said burner for providing an electronic flame signal indicative of the presence and absence of flame at said burner;

electronic ignition and control means coupled to said electrically actuable ignition means and receptive of said flame signal for causing said ignition means to ignite said burner and for monitoring said flame signal for the presence and absence of flame;

said electronic ignition and control means having manually actuable means for causing a first ignition event to occur in response to manual actuation whereby said ignition means is actuated;

said electronic ignition and control means having automatic means for selectively causing said second ignition event to occur automatically following said first ignition event whereby said ignition means is again actuated;





said electronic ignition and control means being responsive to said flame signal for causing said second ignition event to occur when said flame signal indicates the absence of flame subsequent to said first ignition event;

said electronic ignition and control means including a microprocessor control system connected to a system ground and an ignition system comprising a pair of spaced apart electrodes for sending and receiving an electrical ignition spark, said electrodes each being isolated from said system ground and being controlled by said microprocessor control system;

said flame sensing means comprising impedance bridge means coupled to said electrodes for measuring the relative impedance of the air space between said electrodes, said impedance bridge means being coupled to said microprocessor control system which causes said second ignition event to occur.

5,003,961

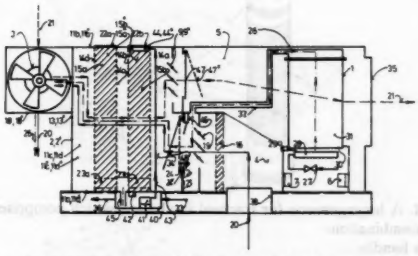
APPARATUS FOR ULTRA HIGH ENERGY EFFICIENT HEATING, COOLING AND DEHUMIDIFYING OF AIR

Ferdinand K. Besik, 2562 Oshkin Ct., Mississauga, Ontario, Canada L5N 3Z3

Continuation-in-part of Ser. No. 152,808, Feb. 5, 1988, Pat. No. 4,952,283. This application Aug. 16, 1988, Ser. No. 232,856

Int. Cl.[5] F24H 7/04

U.S. Cl. 126—110 R **20 Claims**



1. Apparatus for ultra high energy efficient heating, cooling and dehumidifying of air, said apparatus comprising:

combustion means for generating useful heat for heating of an air stream, said combustion means including combustion control means and flue gas discharge means,

matrix container means including at least one matrix container for retaining matrix means, with each said container including front, rear and side walls, and screen means separating each said container into first, second, and third consecutive chambers, said first and third chambers having at least one intake-exit opening for intake and for exit of first and second air streams, said second chamber housing said matrix means and having flanged openings for replacement of said matrix means, said matrix container means operating in a short cycle including a sorption and desorption periods,

matrix means including at least a single matrix means including solid materials for removing of particulates and for absorbing heat and moisture from said first air stream and for simultaneously cooling said first air stream during said sorption period, and then releasing said particulates and said heat and moisture into said second air stream and simultaneously heating said second air stream during said desorption period,

air fan means for pumping said two air streams periodically through said matrix container means in preselected time intervals, said air fan means pumping said two air streams alternately and countercurrently to each other through said matrix container means and said matrix means during said sorption and desorption periods to facilitate countercurrent transfer of heat and moisture between said two air streams,

compartment means in communication with said matrix container means, said compartment means housing said combustion means and including an intake and an exit means for intake and exit of said two air streams, and

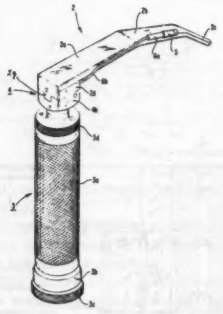
process control means interconnected with said matrix means and said air fan means, and provided for controlling said operating cycle of said matrix means by regular periodic switching of said air fan means, and for maintaining a continuous operation of said apparatus operating in either of a heating mode, cooling mode, and or a dehumidifying mode.

5,003,962

LARYNGOSCOPE WITH DOUBLE-ANGLE BLADE

Jay J. Choi, 7 Moran Rd., West Orange, N.J. 07052

Continuation of Ser. No. 349,836, May 10, 1989, abandoned. This application Jul. 26, 1990, Ser. No. 560,218
Int. Cl.[5] A61B *1/06*
U.S. Cl. 128—11 5 Claims



1. A laryngoscope for tracheal intubation which comprises in combination:

a handle;

a blade the proximal end of which is coupled so that it extends outward L-fashion from the end of the handle, said blade of substantially flat solid section being shaped in the form of a spatula having a tip, being bent inwardly through a first and second bend toward the principal axis of the handle, forming at least two acute angles in said spatula along the length between the coupling with the handle and the tip so that the extent of the blade or spatula is divided into at least three relatively straight sections, angled inwardly toward one another and

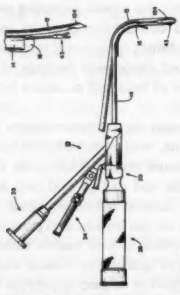
wherein said first bend is formed on said spatula about halfway between its proximal end and its tip, and said second bend is formed more than two-thirds of the distance from said first bend to said tip.

5,003,963

LARYNGOSCOPE

James R. Bullard, 707 Somerset Way, Augusta, Ga. 30909; Richard P. Muller, Bronx, N.Y.; Benedetto Grossi, Stamford, Conn., and John Cristine, Bath, N.Y., assignors to James Roger Bullard, Augusta, Ga.

Division of Ser. No. 315,214, Feb. 23, 1989, Pat. No. 4,905,669, which is a continuation of Ser. No. 101,834, Sep. 28, 1987, abandoned. This application Mar. 5, 1990, Ser. No. 489,272
Int. Cl.[5] A61B *1/26*
U.S. Cl. 128—11 6 Claims



1. A method of placing an object into the larynx and trachea region of a patient comprising the steps of:

inserting a laryngoscope having a placement device movably connected therewith into the patient;

conecting the object to the placement device; moving a distal portion of the placement device from a first home position proximate a distal region of the laryngoscope to a second extended position, the object to be placed also moving relative with the distal portion of the placement device; and

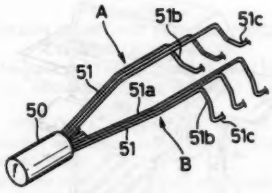
releasing the object to be placed from the placement device.

5,003,964

ENDOSCOPE AND JIG FOR PROCESSING SIGNAL CONDUCTORS OF ENDOSCOPE

Nobuo Koshikawa, and Masahiro Inoue, both of Tokyo, Japan, assignors to Kabushiki Kaisha Machida Seisakusho, Tokyo, Japan

Filed May 30, 1990, Ser. No. 530,406
Claims priority, application Japan, Jun. 15, 1989, 1-69053[U]
Int. Cl.[5] A61B *1/04*
U.S. Cl. 128—4 7 Claims



1. An endoscope comprising:

(a) a hollow body having a remotely-manipulating means;

(b) a hollow insertion portion extending from said body;

(c) a hollow bending portion extending from a distal end of said insertion portion, said bending portion being bendable by manipulating said remotely-manipulating means;

(d) a rigid portion mounted on a distal end of said bending portion;

(e) an elongated component part extending from said rigid portion toward said body through said bending portion and said insertion portion;

(f) an electric device attached to said rigid portion; and

(g) signal conductors connected at one ends to said electric device and extending therefrom toward said body through said bending portion and said insertion portion, each of said signal conductors being bent at said bending portion and having an intersecting portion extending in a direction intersecting a longitudinal direction of said bending portion.

5,003,965

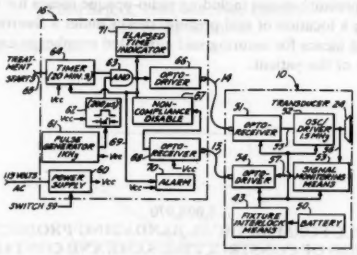
MEDICAL DEVICE FOR ULTRASONIC TREATMENT OF LIVING TISSUE AND/OR CELLS

Roger J. Talish, Fairfield; and Arthur L. Lifshey, East Brunswick, both of N.J., assignors to Meditron Corporation, Spring Valley, N.Y.

Filed Sep. 14, 1988, Ser. No. 247,105
Int. Cl.[5] A61B *17/56*
U.S. Cl. 128—24 AA 28 Claims

1. For use in the treatment of living tissue and/or cells with ultrasonic radiation, a self-contained treatment-head unit comprising a housing having an external-access port, an ultrasonic generator and a power source connected to said generator and contained within said housing, an ultrasonic transducer connected to said generator and having an active body-application face exposed externally of said housing, said generator being specifically tuned for efficient coupling to said transducer, and

control means for said generator including photo-sensitive device means carried within said housing and adapted via said



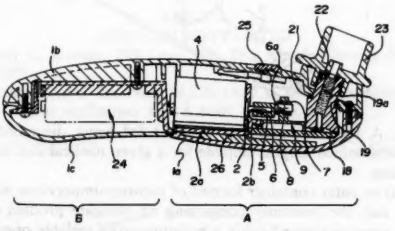
port to produce electrical-control signals governing operation of said generator.

5,003,966

SUCTION DEVICE

Kenji Saka, Kanagawa; Masao Terai, Hyogo, and Kanji Yamamoto, Osaka, all of Japan, assignors to Kanebo, Ltd., Osaka, Japan

Filed Oct. 13, 1989, Ser. No. 420,865
Claims priority, application Japan, Oct. 15, 1988, 63-134645
Int. Cl.[5] A61H *7/00*
U.S. Cl. 128—39 **3 Claims**



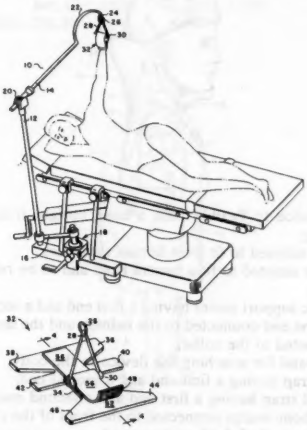
1. A facial massage including a suction device comprising a hollow case having a suction opening, a suction pump included in said case and a driving motor for said suction pump, which is characterized in that said suction device comprises a bottom plate, a diaphragm made of flexible material and disposed on said bottom plate, said diaphragm forming a dome section, first and second cutting portions formed at the end part of said diaphragm, a suction valve made of flexible material extending from the wall to the center of the first cutting portion, an exhaust valve made of flexible material extending from the wall to the center of said second cutting portion, a suction cylinder of which the one end opening faces said suction valve and another end opening extends to a suction opening of said hollow case, an exhaust passage of which the one end faces said exhaust valve and the another end extends to outside, first and second long grooves disposed on said bottom plate and extending from the dome section of said diaphragm to said first and second cutting portions, wherein the dome section of said diaphragm is in connection with an eccentric shaft disposed at a driving axis of said motor to move up and down.

5,003,967

HAND TRACTION WRAP

Bernard E. McConnell, 4725 Wellington St., Greenville, Tex. 75401

Filed Mar. 25, 1988, Ser. No. 173,440
Int. Cl.[5] A61F *5/10, 13/00;* **A41D** *19/00*
U.S. Cl. 128—77 **1 Claim**



1. A traction wrap assembly for attachment to a patient's hand comprising, in combination:

a flexible base panel member having a proximal end portion, a middle portion and a distal end portion;

first and second proximal flaps extending transversely from the proximal end portion of said base panel member;

first and second middle flaps extending transversely from the middle portion of said base panel member;

first and second distal flaps extending transversely from the distal end portion of said base panel member;

said base panel member being foldable about a patient's hand and fingers in a closed fist position with the proximal end portion of the base panel member overlapping the wrist and the back of the hand, the middle portion of the base panel member overlapping the flexed fingers and knuckles, and the distal end portion of the base panel member overlapping the base of the hand and the wrist;

said first and second proximal flaps being wrappable around a patient's wrist in overlapping engagement with each other;

said middle flaps being foldable along the closed fist and extendable in overlapping engagement with the proximal portion of the base panel member;

the first and second distal flaps being foldable around the wrist and base of the hand in overlapping engagement with the first and second middle flaps and in overlapping engagement with the proximal end portion of the base panel member;

coacting fasteners secured to said flaps and to said base panel member for retaining said base panel member and flaps in wrapped engagement about the patient's closed fist;

a flexible coupling panel having a proximal end portion, a middle end portion and a distal end portion, said flexible coupling panel being foldable about said base panel member for engaging the proximal end portion, middle portion and distal end portion of said base panel member, respectively; and,

a traction bar confined between the middle portions of said base panel member and said coupling panel member.

5,003,968

HEAD SUPPORT

Suzanne P. Mars, 23649 Duffield Rd., Shaker Hts., Ohio 44122

Filed Apr. 16, 1990, Ser. No. 509,466
Int. Cl.[5] A61F *5/01*
U.S. Cl. 128—87 B 12 Claims

1. A device to flexibly hold a head upright from above, comprising:

a collar adapted to fit over human shoulders;

a helmet adapted to fit a human head and to be retained in place;

an elastic support means having a first end and a second end, the first end connected to the helmet, and the second end connected to the collar;

a waistband for attaching the device to the body;

a first strap having a first end and a second end;

a second strap having a first end and a second end;

a breastbone bridge connected to the front of the collar and the first end of the first strap; and

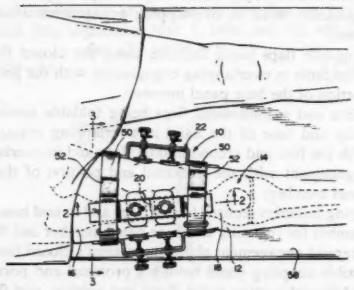
wherein the first end of the second strap is connected to the collar, the second end of the second strap is connected to the back of the waistband, said second strap serving to anchor the back of the collar to the waistband and the second end of the first strap is connected to the front of the waistband, said first strap serving to anchor the breast bone bridge and connected collar to the waistband.

5,003,969

FRACTURE ALIGNMENT DEVICE

Samir N. Azer, Alexandria, Va.; Naser N. Salman, Rockville, Md., and William R. Krause, Richmond, Va., assignors to Orthopedic Designs, Inc., Alexandria, Va.

Filed Feb. 21, 1990, Ser. No. 482,805
Int. Cl.[5] A61F *5/04*
U.S. Cl. 128—87 R 14 Claims



1. A fracture alignment and retention device comprising:

alignment means for aligning bone fragments,

said alignment means including elongated members spaced about the periphery of an extremity of a patient and being substantially radio-transparent,

said alignment means mounted on said elongated members including pressure means for shifting bone fragments with respect to each other in different planes of the bone fragments so as to align the bone fragments along a longitudinal axis, and

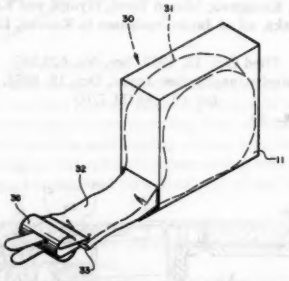
said pressure means including radio-opaque means for viewing a location of said pressure means under a fluoroscope and means for securing said elongated member to extremity of the patient.

5,003,970

ROLL FORM MEDICAL BANDAGING PRODUCT, METHOD OF CONSTRUCTING SAME AND CONTAINER FOR ROLL FORM BANDAGING PRODUCT

A. Bruce Parker, Charlotte, and Donna F. Miller, Harrisburg, both of N.C., assignors to Parker Medical Associates, Charlotte, N.C.

Continuation-in-part of Ser. No. 243,585, Sep. 12, 1988, Pat. No. 4,899,738, which is a continuation of Ser. No. 243,584, Sep. 12, 1988, Pat. No. 4,869,046, which is a division of Ser. No. 815, Jan. 6, 1987, Pat. No. 4,770,299. This application Feb. 8, 1990, Ser. No. 477,021
The portion of the term of this patent subsequent to Sep. 13, 2005, has been disclaimed.
Int. Cl.[5] A61F *13/04;* B65D *85/66*
U.S. Cl. 128—90 26 Claims



1. A medical bandaging product for being dispensed in predetermined lengths suitable for a given medical use, comprising:

(a) an outer container formed of moisture-impervious material, the container comprising an elongate product dispensing sleeve having a moisture-proof sealable opening on one end and an enlarged product storage package communicating with the dispensing sleeve;

(b) a medical material positioned in the container in substantially moisture-free conditions and sealed therein against entry of moisture until use, the medical material comprising:

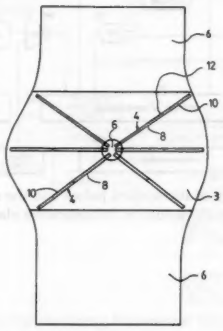
(i) a substrate;

(ii) a reactive system impregnated into or coated onto the substrate, the system remaining stable when maintained in substantially moisture-free conditions and hardening upon exposure to sufficient moisture to form a rigid, self supporting structure; and

(iii) a soft, flexible protective wrapping enclosing the substrate along its length to provide a cushioning barrier between the substrate and the skin of a patient when the material is in use;

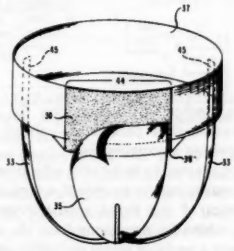
(c) means for resealing the dispensing sleeve against entry of moisture after a predetermined length of the bandaging product has been dispensed for use to prevent hardening of the substrate remaining in the product container.

5,003,971
EXPANSION SYSTEM FOR A MEDICAL AND SURGICAL DRESSING
John T. Buckley, 175 Sasco Hill Rd., Fairfield, Conn. 06430
Filed Sep. 2, 1988, Ser. No. 239,701
Int. Cl.[5] A61L *15/00*
U.S. Cl. 128—156 28 Claims



1. A dressing for protecting a wound area on a living being, said dressing comprising:
at least a first layer for covering and protecting said wound area, and
a second layer joined to said first layer, said second layer being oriented outwardly of said first layer relative to said wound area,
said first and second layers including means for expanding said dressing to define an enclosed space between the joined first and second layers of said dressing and said wound area such that said dressing covers but does not directly contact said wound area.

5,003,972
ATHLETIC SUPPORTER
Jeffrey L. Kestler, 249 Long Hill Dr., Morris County, N.J. 07078
Continuation of Ser. No. 114,220, Oct. 28, 1987, abandoned.
This application Apr. 3, 1989, Ser. No. 333,725
Int. Cl.[5] A41B *9/12*
U.S. Cl. 128—158 6 Claims



1. A body comprising (1) a waistband, (2) a pouch, a substantial portion of which is stretchable, said pouch attachable to the front portion of said waistband, said pouch configured for supporting a scrotum and penis, and (3) a holding member extending from the bottom of said pouch to said waistband characterized in that said body includes a means for attaching said pouch to said waistband such that said means of attachment provides a plurality of positions attachment extending in the direction from the bottom to the top of said waistband and such that substantial pucker of said waistband and substantial sag of said pouch is avoided.

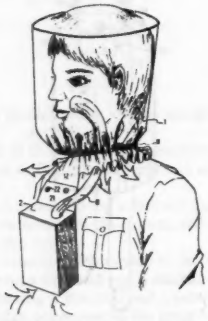
5,003,973
RESCUE HELMET APPARATUS
Theodore H. Ford, and Mary A. Ford, both of 6416 Lakepoint Pl., Parker, Colo. 80134
Continuation-in-part of Ser. No. 144,069, Jan. 15, 1988, abandoned. This application Apr. 20, 1989, Ser. No. 340,693
Int. Cl.[5] A62B *7/02, 7/08, 17/04*
U.S. Cl. 128—201.25 5 Claims

1. A rescue helmet apparatus, comprising:
a base helmet member having a neck orifice at a lower portion of said helmet member;
a transparent face shield member rigidly affixed and integral with said base helmet member;
said neck orifice of said base helmet member having elastic means for sealing the interior of said base helmet member;
said base helmet member having a lowermost mounting means integral therewith that has receptacle means for an illumination means, said illumination mean being incorporated therein, said illumination means being disposed proximate to a means for providing breathable air;
said means for providing breathable air detachably mounted to said lowermost mounting means whereby a user inhales clean air and is protected from the effects of oxygen-depleted air, smoke or noxious fumes and is further protected from heat and exposure to flame;
a reflective cape overlying said base helmet member, said reflective cape substantially enfolding the shoulders, back and chest of a wearer whereby heat is reflected from said apparatus to thus protect the head, back, chest and shoulders of a wearer of the device; and
said base helmet member substantially rounded and having cushion means interiorly disposed along said neck orifice and longitudinally about the interior of said base helmet member at substantially even intervals.

5,003,974
FIRST-AID GAS MASK
Lin-Her Mou, Fl. 5, No. 6, Lane 394, Long Chang Rd., Taipei, Taiwan
Filed Oct. 27, 1989, Ser. No. 427,494
Int. Cl.[5] A62B *7/10*
U.S. Cl. 128—201.25 1 Claim

1. A first-aid gas mask including a transparent cover, for enclosing the head of a wearer; an air filter and a flexible air pipe, wherein said transparent cover is comprised of a rigid ring having two oppositely positioned notches thereon to permit folding of said transparent cover, and said cover being made of soft transparent and heat resisting material having a

bottom end and an opening therein with an elastic band thereon for fastening around the neck of a wearer, said cover further comprising a rectangular flap extending downward from the bottom end, said rectangular flap having two male snap fasteners thereon and said air filter being comprised of a rectangular case including a flap with two female snap fasteners thereon to fasten with the two male snap fasteners on said rectangular flap, said rectangular case having a top and a bottom and an inner space divided into battery chamber for setting therein of four batteries; a motor room below said battery chamber for a motor and a motor seat with a motor shaft disposed at the bottom; a vane wheel room for containing a vane wheel and a shell, said vane wheel being fixedly mounted on said motor shaft of said motor and covered by said



shell; a filter room below said vane wheel room for containing a filter case, the filter case having active carbon arranged thereinside and a draft chamber vertically set at one side, and elongated draft holes at the bottom of said case, said draft holes communicating with said draft chamber, and an air outlet hole at the top of said case, and wherein said flexible air pipe having one end connected to the air outlet hole of said air filter and having the other end inserted into said transparent cover and disposed at the nose and mouth area of the user who puts on the present gas mask, to provide the user with clean air; and wherein said batteries provide said motor with working power to drive said vane wheel to rotate so as to bring in outside air through said filter case for filtration, and to let the filtrated clean air be delivered through said flexible air pipe to the user for inhalation.

5,003,975

AUTOMATIC ELECTRODE CONFIGURATION OF AN IMPLANTABLE PACEMAKER

Werner Hafelfinger, Valencia; Jason A. Sholder, Northridge; Murray P. King, Simi Valley, all of Calif., and James L. Duncan, Alpharetta, Ga., assignors to Siemens-Pacesetter, Inc., Sylmar, Calif.

Continuation-in-part of Ser. No. 183,197, Apr. 29, 1988. This application Oct. 17, 1989, Ser. No. 422,933

Int. Cl.[5] A61N *1/00*

U.S. Cl. 128—419 PG **29 Claims**

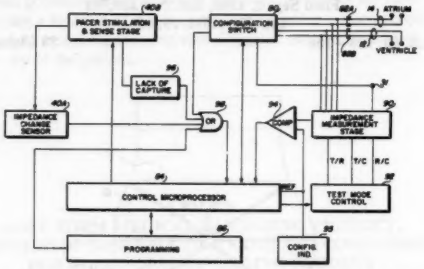
1. In an implantable pacemaker capable of programmably altering an electrode configuration for delivery of stimulation pulses and for sensing intracardiac signals, a system for ensuring operation of the implantable pacemaker despite incorrect programming or broken conductors, the system comprising:

at least two pairs of electrode terminals located in the pacemaker;

a pair of electrodes adapted for contact with body tissue, the pair of electrodes being coupled to at least one pair of electrode terminals;

detection means for detecting an operative electrode configuration by detecting an operative combination of electrodes and electrode terminals; and

programming means for automatically programing the pacemaker's electrode configuration to the operative electrode configuration detected by the detection means, such that



the delivery of stimulation pulses and the sensing of intracardiac signals occurs in the operative electrode configuration.

5,003,976

CARDIAC AND PULMONARY PHYSIOLOGICAL ANALYSIS VIA INTRACARDIAC MEASUREMENTS WITH A SINGLE SENSOR

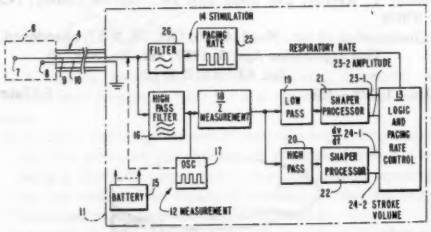
Eckhard Alt, Eichendorffstrasse 52, 8012 Ottobrunn, Fed. Rep. of Germany

Filed Sep. 28, 1988, Ser. No. 250,155

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1987, 3732640

Int. Cl.[5] A61N *1/368*

U.S. Cl. 128—419 PG **27 Claims**



1. Electronic medical instrumentation for determining a plurality of physiological parameters related to a patient's condition, comprising in combination:

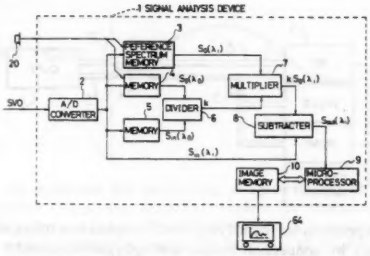
a single sensor adapted to be located wholly within the heart including sensor means to detect a signal varying with characteristics of the blood with corresponding signal processing means for producing from the signal detected at said sensor a variable signal including information representative of a plurality of physiological parameters of the patient related to cardiac blood flow parameters, and

physiological activity detection means for processing the variable signal including signal processing means for separating said variable signal into subsignals respectively representative of the plurality of the patient's physiological parameters presented in said variable signal derived from blood characteristics at the in-situ position of the sensor in the heart.

5,003,977
DEVICE FOR ANALYZING FLUORESCENT LIGHT SIGNALS

Susumu Suzuki; Kazuyuki Ishida, both of Hamamatsu, and Takeo Ozaki, Hamakita, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Mar. 9, 1989, Ser. No. 321,296
Int. Cl.[5] A61B *1/06, 6/00*
U.S. Cl. 128—633 **3 Claims**



1. A device for analyzing fluorescent light signals, comprising:

first light-irradiating means for irradiating a normal position of an organism with first laser light;

first light-detecting means for detecting a first spectrum of fluorescence excited by the irradiation of said first laser light;

memory means for storing, as a reference spectrum, the first spectrum of fluorescence detected by said first light-detecting means;

second light-irradiating means for irradiating with second laser light a position to be diagnosed of the organism injected with a fluorescent substance having a strong affinity for tumors;

second light-detecting means for detecting a second spectrum of fluorescence excited by the irradiation of said second laser light;

correction means for correcting said reference spectrum on the basis of a ratio of an intensity of a specific wavelength in the second spectrum detected by said second light-detecting means to an intensity of the same wavelength as said specific wavelength in said reference spectrum; and

extraction means for subtracting the corrected reference spectrum from the detected second spectrum and extracting the difference.

5,003,978
NON-POLARIZABLE DRY BIOMEDICAL ELECTRODE

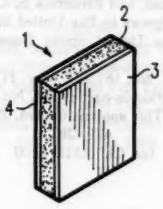
W. J. Dunseath, Jr., Durham, N.C., assignor to Technology 21, Inc., Durham, N.C.

Continuation-in-part of Ser. No. 196,661, May 20, 1988, Pat. No. 4,865,039, which is a continuation of Ser. No. 989,235, Aug. 20, 1986, which is a continuation-in-part of Ser. No. 767,963, Aug. 25, 1985. This application Sep. 7, 1989, Ser. No. 403,825
Int. Cl.[5] A61B *5/402*
U.S. Cl. 128—640 **36 Claims**

1. A dry electrode system for the detection of biopotentials existing on the surface of the skin of a living body, comprising:

a dry electrode having opposed sides, one of which is adapted to contact said skin, said dry electrode comprising a non-polarizable conductive substrate having opposed sides, and first and second adhesive layers applied to the opposite sides of said non-polarizable conductive substrate, said first adhesive layer being ionically conductive and adapted to adhere said dry electrode to said skin; and

a non-polarizable electrically conductive contact adhered to by said second adhesive layer and in conductive contact

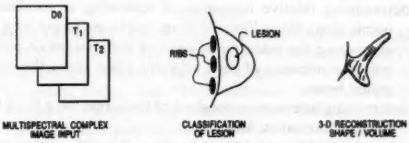


with said substrate via said second adhesive layer for conducting a biopotential from said dry electrode.

5,003,979
SYSTEM AND METHOD FOR THE NONINVASIVE IDENTIFICATION AND DISPLAY OF BREAST LESIONS AND THE LIKE

Michael B. Merickel; Ann H. Adams, and James R. Brookeman, all of Charlottesville, Va., assignors to University of Virginia, Charlottesville, Va.

Filed Feb. 21, 1989, Ser. No. 313,183
Int. Cl.[5] A61B *5/55*
U.S. Cl. 128—653 A **20 Claims**



11. A noninvasive imaging analysis system for the display of a body part composed of different tissue types of interest of a mammalian live body where the boundary of said tissue types encloses an area or volume and where the boundary shape is of significance using information obtained from multiple image slices produced by a body scan such as MRI and PET comprising:

an electronic digital storage means for storing said information as well as other information;

a computer for processing said information from said storage means;

a graphics display station for displaying an image resulting from said processed information;

said computer for processing including

means for taking multiple sequenced image slices resulting from the body scan and determining the boundary shape of one or more of said tissue types of interest;

means for classifying at least some of said tissue types in said body part by comparing said tissue types to classifier parameters of said tissue types stored in said storage means;

means for determining the boundary shape of one or more of said tissue types of interest which have been classified; and

means for displaying said one or more tissue types of interest including its location, size and boundary shape thereof.

5,003,980

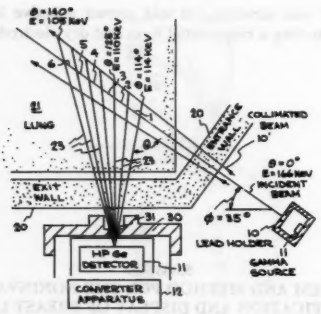
METHOD AND APPARATUS FOR MEASURING LUNG DENSITY BY COMPTON BACKSCATTERING

Billy W. Loo, Oakland, and Frederick S. Goulding, Lafayette, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 167,207, Mar. 11, 1988, abandoned, which is a continuation-in-part of Ser. No. 788,459, Oct. 17, 1985, abandoned. This application Jan. 29, 1990, Ser. No. 470,420

Int. Cl.[5] A61B *6/00*

U.S. Cl. 128—653 R 37 Claims



1. A non-invasive method for measuring lung density comprising the steps of:

irradiating a target lung with a single collimated beam of monochromatic photons;

using a single high-resolution detector, detecting photons which are Compton backscattered by the target lung;

measuring energies of the backscattered photons;

determining relative intensities of scattering at successive points along the collimated beam inside the target lung by comparing the intensity of each of the successive points with the intensity of each adjacent point along the collimated beam;

determining attenuation constant of the target lung from the relative intensities; and

determining density of the target lung from the attenuation constant.

18. A Compton densitometer for measuring lung density through a wall of unknown composition and thickness comprising:

source means for producing a single collimated beam of monoenergetic photons adapted for irradiating an associated target lung located behind such a wall of unknown composition and thickness;

a single high-resolution detector means for detecting Compton backscattered photons caused by irradiation of such an associated target lung located behind a wall of unknown composition and thickness with said collimated beam of photons, said detector means being positions at an angle ϕ with respect to the collimated beam so as to receive backscattered photons from and angle θ with respect to the collimated beam; an apparatus operatively connected to said detector means and including: means for measuring energies of the backscattered photons, means for determining relative intensities of scattering at successive points along the collimated beam inside such an associated target lung, means for determining attenuation constant of such an associated target lung from the relative intensities, and means for determining density of such an associated target lung from the attenuation constant when irradiated by said collimated beam of photons from said source.

5,003,981

IDENTIFICATION METHOD FOR THE CUFF SIZE IN A SPHYGMOMANOMETER AND FLOW RESTRICTION MEANS REQUIRED IN IDENTIFICATION

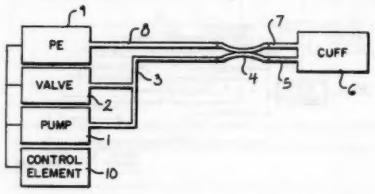
Lauri P. A. Kankkunen, Espoo; Raimo A. T. Piskunen, Vantaa, and Börje T. Rantala, Helsinki, all of Finland, assignors to Instrumentarium Corporation, Finland

Filed Jul. 6, 1989, Ser. No. 376,984

Claims priority, application Finland, Jul. 8, 1988, 883293

Int. Cl.[5] A61B *5/02*

U.S. Cl. 128—677 27 Claims



1. Apparatus for identifying a cuff coupled to a sphygmomanometer by connection means, said sphygmomanometer having means for creating a change in the pressure of a fluid in the connection means and having means for sensing fluid pressure phenomena in the connection means, said apparatus comprising:

means operatively associated with the cuff and insertable in the connection means when the cuff is connected to the sphygmomanometer for restricting transfer of fluid pressure changes between a first portion of the connection means and a second portion of the connection means, whereby the sensing means can identify the cuff by means of the fluid pressure phenomena resulting from the presence of the restricting means in the connection means.

5,003,982

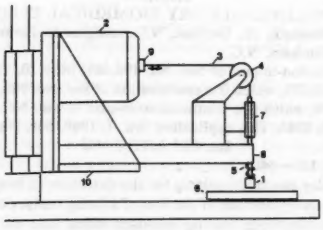
DYNAMIC INDENTATION SYSTEM

Henry R. Halperin, Baltimore, Md., assignor to Johns Hopkins University, Baltimore, Md.

Filed Jul. 28, 1989, Ser. No. 386,249

Int. Cl.[5] A61B *5/02*

U.S. Cl. 128—695 12 Claims



1. A system comprising:

a probe having an indentation surface;

displacement means coupled to said probe for repetitively displacing said indentation surface at a rate of about 10 to about 150 Hz to induce a stress in said material; and

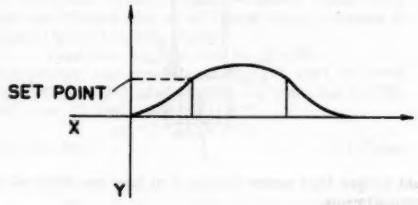
means for measuring said stress.

5,003,983

CARDIAC MONITORING SYSTEM

Robert P. Dingwall, Clinton Corners, and Howard T. Bellin, New York, both of N.Y., assignors to Cortec, Inc., New York, N.Y.

Filed Aug. 25, 1988, Ser. No. 236,899
Int. Cl.[5] A61B 5/04
U.S. Cl. 128—704 12 Claims



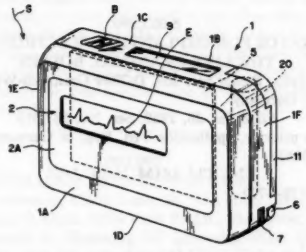
1. An apparatus for monitoring and converting an EKG waveform comprising electrical sensors for detecting said EKG waveform, a signal conditioning means in communication with said electrical sensors for inverting all negative portions of said detected EKG waveform, a pulse generator means including a low pass filter means for generating pulses having pulse width modulated by a change in location of a ST segment of said EKG waveform, and a comparator means for determining the amount of ST segment deviation from a normal value.

5,003,984

APPARATUS FOR ALERTING A DOCTOR BY RADIO TO PROVIDE AN ALARM FOR A PATIENT

Yoshiya Muraki, and Hiroyuki Koike, both of Tokyo, Japan, assignors to Fukuda Densky Co, Ltd., Tokyo, Japan

Filed Jan. 31, 1990, Ser. No. 473,061
Claims priority, application Japan, Oct. 23, 1989, 1-123851[U]
Int. Cl.[5] A61B 5/04
U.S. Cl. 128—710 10 Claims



1. An apparatus for alerting a doctor which provides an alarm corresponding to a patient by receiving living body information signals S transmitted by radio through a transmitter and providing said doctor with a buzzer sound or a vibration to indicate that the condition of the patient corresponding to the living body information signals S has suddenly changed, said apparatus comprising:

a portable casing having a front plate, a rear plate connected to positioning means for positioning said casing, a top plate, a bottom plate, a left plate, and a right plate;

a circuit plate provided within said casing;

an electric circuit mounted on said circuit plate for receiving said living body information signals S transmitted by radio from said transmitter; and

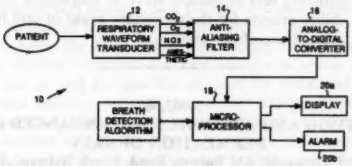
display means provided on said casing and connected with said electric circuit, said display means displaying said living body information signals S received by said electric circuit, said displayed living body information signals S including at least a wave form E of electrocardiogram signals.

5,003,985

END TIDAL RESPIRATORY MONITOR

Curtis D. White, and Billy L. Carpenter, both of San Antonio, Tex., assignors to Nippon Colin Co., Ltd., Japan

Continuation of Ser. No. 135,005, Dec. 18, 1987, abandoned. This application Oct. 19, 1989, Ser. No. 423,643
Int. Cl.[5] A61B 5/08
U.S. Cl. 128—716 8 Claims



1. An end-tidal respiratory monitor, comprising:

means for detecting a respiratory waveform comprising only expired carbon dioxide produced by a patient during a predetermined time interval and producing an electrical signal representation thereof;

programmable analyzer means adapted to receive said electrical signal representation of said respiratory waveform, said analyzer means further comprising means for calculating the inspiratory, expiratory and respiratory periods of said respiratory waveform of said patient and for producing respective output signals for each said period; and

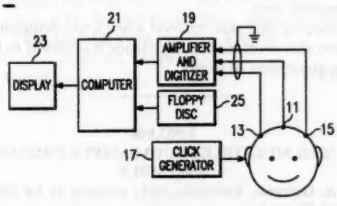
display means for indicating the respiratory characteristics of said patient corresponding to said respective output signals of said analyzer means.

5,003,986

HIERARCHIAL ANALYSIS FOR PROCESSING BRAIN STEM SIGNALS TO DEFINE A PROMINENT WAVE

Terese Finitzo, Dallas, Tex., and Kenneth D. Pool, Jr., 3001 Coronado, Irving, Tex. 75062, assignors to Kenneth D. Pool, Jr. and Electrophysiology Laboratories of Dallas, Inc., both of Dallas, Tex., a part interest

Filed Nov. 17, 1988, Ser. No. 272,714
Int. Cl.[5] A61B 5/04
U.S. Cl. 128—731 36 Claims



32. A method for analyzing brain stem waveform traces using a computerized signal waveform processing system so as to identify a prominent wave, comprising the steps of:

storing and processing digital signals using a program controlled processor;

displaying the processed digital signals;

analyzing said digital signals using a program having instructions carried out by said processor, said analyzation including:

analyzing digital signals of related first and second waveform traces to define primary peaks which satisfy a

predetermined criteria, each said primary peak having associated preceding and succeeding troughs;

if a primary peak is not determined by initial analyzation of said digital signals, filtering said digital signals with a predefined bandpass and again analyzing the filtered digital signals until one said primary peak is found in each said waveform trace;

analyzing said primary peaks to determine secondary peaks;

analyzing said secondary peaks to characterize said secondary peaks according to predefined criteria;

determining reproducibility of said secondary peaks between said first and second waveform traces; and

identifying said prominent wave by employing reproducibility criteria for the secondary peaks of said first and second waveform traces.

5,003,987

METHOD AND APPARATUS FOR ENHANCED DRUG PERMEATION OF SKIN

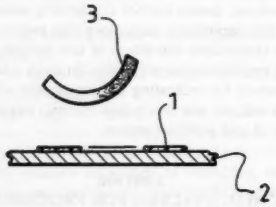
Paul M. Grinwald, 434 Balwyn Road, North Balwyn, Australia 3104

Filed Sep. 8, 1988, Ser. No. 241,354

Claims priority, application Australia, Sep. 11, 1987, PI4342; Nov. 25, 1987, PI5676

Int. Cl.[5] A61B *5/05*

U.S. Cl. 128—734 **25 Claims**



16. A method of skin preparation to facilitate absorption of drugs comprising the following steps:

(a) Removing the outermost layers of the skin by wet or dry abrasion, wherein skin removal is delimited by application to the skin of a single use target masking tape consisting of a disk of adhesive backed tape with a central aperture;

(b) Measuring the change in electrical resistance or impedance of the skin as said outermost layers of the skin are removed; and,

(c) Stopping said skin removal when a pre-determined optimum skin resistance or impedance is achieved to facilitate the absorption of drugs.

5,003,988

MODULAR MULTIPLE FLUID SAMPLE PREPARATION ASSEMBLY

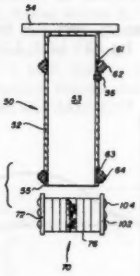
Raouf A. Guirguis, Rockville, Md., assignor to La Mina Ltd., British Virgin Isls.

Continuation-in-part of Ser. No. 369,610, Jun. 21, 1989. This application Aug. 22, 1989, Ser. No. 396,655

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—771 **20 Claims**

1. An apparatus for collecting molecular samples from biological fluids to obtain multiple markers comprising a first container means; a sample collection storage unit removably mounted to said first container means, said sample collection storage unit comprising a container divided into plurality of bead containing compartments, control bead means positioned in one said compartments, at least two different antigen bead means located in at least another of said compartments; and at least two different anti-antibody bead means corresponding to



said antigen bead means located in at least one other of said compartments.

5,003,989

STEERABLE DILATION CATHETER

Charles S. Taylor, San Francisco, and Hilary J. Hampton, Santa Clara, both of Calif., assignors to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.

Division of Ser. No. 350,580, May 11, 1989, Pat. No. 4,955,384. This application Jul. 10, 1990, Ser. No. 550,530

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—772 **13 Claims**

1. A steerable dilatation catheter comprising:

(a) a tubular body having an inner lumen extending therein for delivery of inflation fluid therethrough;

(b) an inflatable balloon on a distal portion of the tubular body adjacent a distal end thereof and in fluid communication with the inner lumen of the tubular body;

(c) a core member extending through the interior of the balloon and out the distal end thereof; and

(d) a flexible length of interfitting links disposed about and secured to the portion of the core member extending out of the distal end of the balloon.

5,003,990

APPARATUS FOR IMPLANTING ELECTRODES AND THE LIKE IN ANIMAL BODIES

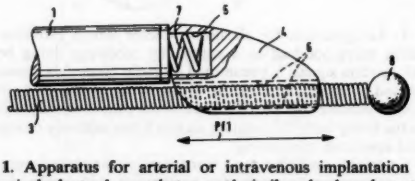
Peter Osypka, Basler Str. 109, D-7889 Grenzach-Wyhlen, Fed. Rep. of Germany

Filed Jul. 28, 1989, Ser. No. 387,515

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1988, 3825631

Int. Cl.[5] A61M *25/01, 1/05*

U.S. Cl. 128—772 **49 Claims**



1. Apparatus for arterial or intravenous implantation of surgical electrodes, catheters and similar slender elongated objects having leading ends into the circulatory system or another cavity of an animal body, especially a human body, comprising at least one elongated flexible guide wire having a proximal end and a distal end; and a discrete carriage guided by and movable along said at least one wire toward and away from said distal end, said carriage having coupling means for releasably holding the leading end of a selected object so that the leading end which is held by said coupling means shares the

movement of the carriage toward said distal end during implantation into the animal body and that the implanted leading end remains in the animal body upon separation from the coupling means and subsequent withdrawal of the coupling means and guide wire from the animal body.

5,003,991

HYPERTHERMIA APPARATUS

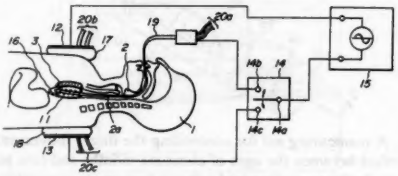
Syuichi Takayama; Takashi Tsukaya; Yasuhiro Ueda; Shinji Hatta, and Masashi Abe, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Mar. 24, 1988, Ser. No. 172,554

Claims priority, application Japan, Mar. 31, 1987, 62-76460; Mar. 31, 1987, 62-76461; Mar. 31, 1987, 62-76463; Apr. 8, 1987, 62-84667; Apr. 17, 1987, 62-94482

Int. Cl.[5] A61N *1/32*

U.S. Cl. 128—784 **11 Claims**



1. A hyperthermia apparatus, comprising:

at least two outside-body electrodes;

at least one inside-body electrode which is insertable into a cavity of a living body;

power source means for supplying high frequency electric power across two selected electrodes, including one of said two outside-body electrodes, to heat a portion of the living body interposed between said two selected electrodes to a desired temperature, said power source means comprising a high frequency power supply circuit with two output terminals, one of said output terminals being connected to a selected one of said two outside-body electrodes; and

selection means for selecting said two selected electrodes, said selection means comprising a switch having a common switching contact connected to the other one of said output terminals and two fixed contacts, one of said two fixed contacts being connected to said inside-body electrode and the other one of said two fixed contacts being connected to the non-selected one of said two outside-body electrodes.

5,003,992

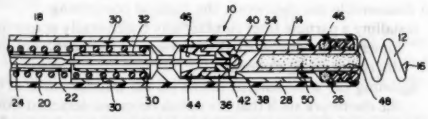
ATRAUMATIC SCREW-IN LEAD

Timothy W. Holleman, 13600 Yancy St. NE., Ham Lake, Minn. 55304; Phong D. Doan, 5598 Park Pl. Dr., Shoreview, Minn. 55126; Kenneth R. Brennen, 160 Talmadge Way, Fridley, Minn. 55432, and John M. Swoyer, 12012 Unity St. N.W., Coon Rapids, Minn. 55433

Filed Aug. 23, 1989, Ser. No. 398,350

Int. Cl.[5] A61N *1/05*

U.S. Cl. 128—785 **11 Claims**



1. A medical electrical lead comprising an elongated insulated conductor having a proximal end and a distal end, an electrical connector mounted to the proximal end of said conductor and an electrode head assembly mounted to the distal end of said conductor, said electrode head assembly comprising:

an electrode head member having a proximal end and a distal end and having a longitudinal lumen open to the distal end of said head member;

a fixation helix extending from the distal end of said head member, axially aligned with the lumen of said head member;

an electrode surface coupled to said conductor exposed to the exterior of said head member adjacent the distal end of said head member; and

a plunger slideably mounted within the lumen of said head member, said plunger having a proximal end and a distal end and having means for dispensing a drug adjacent the distal end of said plunger, said plunger slideable between a first position in which said plunger extends through said fixation helix, the distal end of said plunger located distal to said fixation helix and a second position in which the distal end of said plunger lies adjacent the distal end of said head member, whereby when said fixation helix is screwed into body tissue to bring the distal end of said head member adjacent said body tissue, the distal end of said plunger and its associated means for dispensing a drug are located adjacent body tissue, when said plunger is located in said second position.

5,003,993

METHOD AND APPARATUS FOR PREVENTING AND TREATING ANAEROBIC INFECTIONS

David R. Silver, 719 Washington St., Ste. 104, Newtonville, Mass. 02160

Filed Dec. 20, 1989, Ser. No. 453,598

Int. Cl.[5] A61F *6/02, 5/00*

U.S. Cl. 128—842 **6 Claims**

1. The method of preventing and treating anaerobic infections int he region of the sulcus in uncircumcized human males, said method comprising:

rolling back the foreskin;

providing a radially compliant ring formed of a helically coiled resilient filament of a hard, non-porous material, the relaxed inner diameter of said ring being less than the nominal diameter of the sulcus;

expanding said ring to pass it over the penile head and then seating it in the sulcus behind said head;

releasing the foreskin against said ring thereby allowing air to circulate in the region of the sulcus.

5,003,994

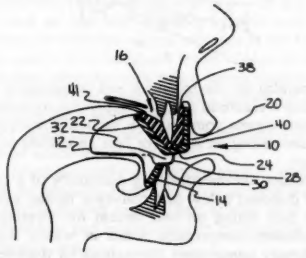
ORAL APPLIANCE FOR IMPROVING BREATHING AND METHODS OF USING AND MAKING SAME

George W. Cook, P.O. Box 70, Holdingford, Minn. 56340

Filed Oct. 10, 1989, Ser. No. 419,076

Int. Cl.[5] A61F *5/56*

U.S. Cl. 128—848 **20 Claims**



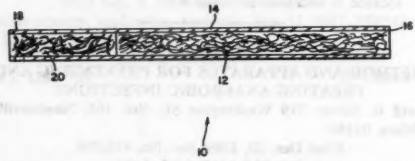
1. An oral appliance for improving breathing during sleep, for reducing apneic events, and for reducing snoring, comprising:

(a) a rigid structural shell
(b) relatively pliable upright tooth socket means for conformably engaging upright inner and outer surfaces of a plurality of maxilla teeth;
(c) generally generally vertical cam structure means projecting downward from a front end of said rigid structural shell for engaging and advancing the mandible structure forward with respect to the maxilla structure; and in which
(d) said pliable tooth socket means is sufficiently soft and pliable so that it does not move a users teeth when the appliance is worn for a period of sleep, so that use of the appliance repetitively for extended periods of sleep is essentially painless.

5,003,995
COMPOSITIONS AND ARTICLES FOR STIMULATING TASTE RECEPTORS

Robert L. Kersey, Morehead City, N.C., assignor to Tripar Incorporated, Stamford, Conn.

Filed Dec. 28, 1989, Ser. No. 458,087
Int. Cl.[5] A24D *1/18*; A24B *15/28*
U.S. Cl. 131—359 **18 Claims**

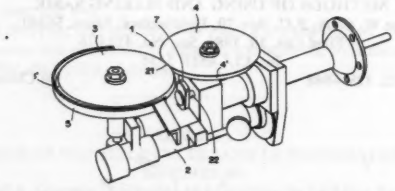


1. A smoking material, which consists essentially of tobacco in admixture with a smoke-enhancing proportion of distiller's dried solubles, said mixture being free of distiller's dried grain.

5,003,996
APPARATUS FOR TRIMMING AND COMPRESSION OF TOBACCO

Bernard Tallier, Georgier, and Otto Hagmann, Neuchatel, both of Switzerland, assignors to Fabriques de Tabac Reunies, S.A., Neuchatel, Switzerland

Filed Aug. 3, 1989, Ser. No. 389,180
Claims priority, application Switzerland, Aug. 10, 1988, 3013/88
Int. Cl.[5] A24C *5/14*
U.S. Cl. 131—84.2 **7 Claims**

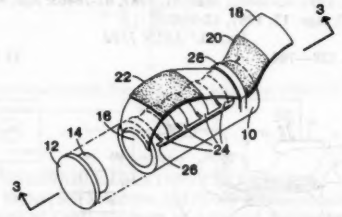


1. Apparatus for the trimming and compression of tobacco for forming a cigarette rod, said apparatus comprising:
conveyor means comprising a suction conveyor arranged for conveying on its lower face an endless stream of tobacco;
compression means consisting essentially of a compression part disposed below said conveyor means, said compression part acting on said stream for forming cyclically distributed compression zones in which the stream is uniformly compressed throughout its thickness, each of said zones corresponding to a tip of a cigarette; and
cutting means comprising a pair of rotating disks disposed below said conveyor means and downstream from said compression means, said disks having plane upper faces and circular peripheral edges defining a permanent zone of mutual contact acting solely as a cutter for portions of said stream lying between said edges.

5,003,997
MANICURING AID FOR INFANTS

Christopher O. Stewart, and Karen Suprise-Mansfield, both of 222 Kearny St., Suite 500, San Francisco, Calif. 94108

Filed Dec. 11, 1989, Ser. No. 448,538
Int. Cl.[5] A45D *29/00*
U.S. Cl. 132—73 **8 Claims**

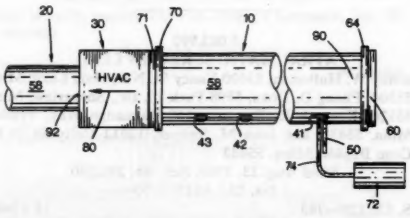


1. A manicuring aid for controlling the finger movement of an infant between the ages of about six months and two years old to facilitate cutting said infant's fingernails, comprising a cylindrical barrel of a size which can be comfortably grasped by a hand of said infant, said cylindrical barrel having a cavity therein, enclosed by an end wall integral with the structure of the barrel and an opposing end wall which is removable to allow access to said cavity, the barrel having four parallel finger grooves oriented orthogonally to the axis of the barrel, a raised fingertip support ledge, an adjustable elastic cloth strap affixed at one end at said cavity adjacent said end wall which is removable, and a loop projecting from the barrel oriented parallel and adjacent to the four finger grooves.

5,003,998
METHOD AND APPARATUS FOR CLEANING AND SANITIZING HVAC SYSTEMS

Donald H. Collett, 4701 NE. 40th Ave., Vancouver, Wash. 98661

Filed Apr. 21, 1989, Ser. No. 341,569
Int. Cl.[5] B08B *5/02*
U.S. Cl. 134—22.12 **18 Claims**



1. A method of cleaning accumulated debris from the interior surfaces of HVAC ductwork in a building without having to disassemble the ductwork, the method comprising:
installing a particle filter substantially transversely across the lumen of the ductwork downstream of the portion of the ductwork to be cleaned;
agitating the accumulated debris on the interior surfaces of the ductwork such that the debris becomes detached from the underlying interior surface of the ductwork, thereby causing the debris to become suspended in air in the lumen of the ductwork; and
moving the air containing suspended debris through the

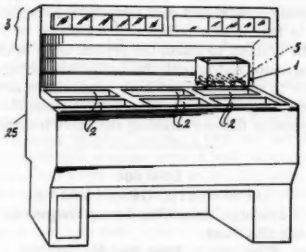
ductwork toward the filter, passing the air through the filter and capturing the debris on the filter.

5,003,999

APPARATUS FOR TREATING SILICON WAFERS IN AN ACID BATH

Silvestro Cardani, Calusco D'Adda, and Flavio Pareschi, Trezzo Sull'Adda, both of Italy, assignors to SGS Thomson Microelectronics S.R.L., Milan, Italy

Filed Oct. 24, 1989, Ser. No. 426,325
Claims priority, application Italy, Nov. 4, 1988, 22510 A/88
Int. Cl.[5] B08B *3/10*; H05B *3/06*
U.S. Cl. 134—105 **19 Claims**



1. An apparatus for treating silicon wafers in an acid bath comprising:

at least one quartz tank having sides and a substantially flat bottom for containing an acid in which silicon wafers are immersed, said tank comprising a plurality of tubular ducts integral with said tank, made of quartz, each said tubular duct being closed at a first end and open at a second end, and horizontally and fixably disposed with its first and second ends being fluid tight in two opposite sides of said tank, such that said tubular ducts are positioned traversing the interior of said tank;

electrical resistance heating members removably received within said tubular ducts, for heating the acid; and

a process bench to which said electrical resistance heater member are removably connected, said tank being positioned in said process bench during use.

5,004,000

APPARATUS FOR RINSING SURFACES WITH A NON-AQUEOUS LIQUID

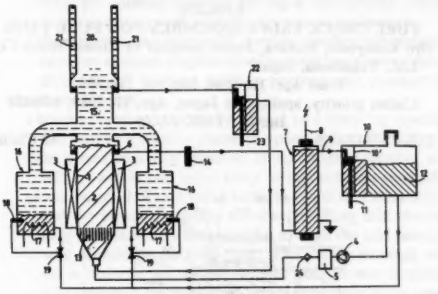
Serge A. Berruex, En Closelet A, CH-1261 Cheserex, Switzerland

Division of Ser. No. 223,679, Jul. 22, 1988, Pat. No. 4,936,921, Continuation of Ser. No. 57,204, May 11, 1987, abandoned. This application Feb. 2, 1990, Ser. No. 473,873
Claims priority, application Switzerland, Sep. 13, 1985, 3984/85
Int. Cl.[5] B08B *3/12, 13/00*
U.S. Cl. 134—108 **12 Claims**

1. Apparatus for removing a film of aqueous liquid from a hydrophilic surface with a non-aqueous liquid, which comprises:

a rinsing zone containing an inert, non-solvent, non-miscible liquid;

means for applying said inert non-solvent liquid against said surface with a force that is effective to form an emulsion with said aqueous liquid being a discontinuous phase and said inert non-solvent liquid being a continuous phase;



means for recovering the emulsion including an emulsion breaking down device which separates the phases of said emulsion; and

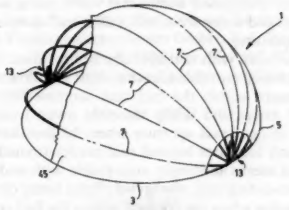
means recycling the recovered inert non-solvent liquid.

5,004,001

FOLDABLE DOME

Victorin Bouchard, 671 Rang 6, St Nazaire de Chicoutimi, Quebec, Canada G0W 2V0

Filed Aug. 8, 1989, Ser. No. 390,867
Int. Cl.[5] E04H *15/18*
U.S. Cl. 135—97 **15 Claims**



1. A foldable dome comprising:

a set of bowed supports made up of a driving bowed support, and end bowed support and intermediate bowed supports, said bowed supports ending into levers projecting out of the planes thereof;

a post supporting said bowed supports on opposite sides of said dome and including, at the top thereof and on each post:

pivot means comprising an axle, transverse to said post, over which said levers on one side of said bowed supports are mounted so as to allow rocking of said bowed supports between a folded position, on one side of said axle, and an unfolded position wherein said bowed supports are disposed around said axle in the form of a dome; said axle dividing said levers of said driving and end bowed supports each into a driven section, on the bowed support side and a driving section on the side away from the bowed supports;

an axially extensible device of which one end is pivotably mounted at the top of said post;

linkage means pivotably connecting another end of said device simultaneously to said lever driving section of said driving bowed support and to said lever driving section of said end bowed support, on opposite sides of said device, and

a sheltering fabric connected successively to adjacent bowed supports so that extension and shortening of said devices causes, through said linkage means, rocking of said bows

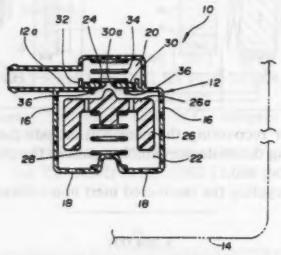
between said positions with driving of said fabric and when said end bowed support is held stationary.

5,004,002

FUEL CHECK VALVE ASSEMBLY FOR FUEL TANK

Jiro Kobayashi, Isehara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 10, 1990, Ser. No. 506,985
Claims priority, application Japan, Apr. 17, 1989, 1-96658
Int. Cl.[5] F16K *17/36*
U.S. Cl. 137—39 12 Claims



1. A fuel check valve assembly in a fuel tank of a vehicle, comprising:

a valve casing installed in the fuel tank to form a passageway for providing communication between the inside and outside of the fuel tank;

a valve seat installed in said valve casing and having an aperture forming part of said passageway;

a float valve disposed within said valve casing and movable toward and away from said valve seat to open and close said aperture;

said valve seat, with said aperture being closed by said float valve, being movable together with said float valve when a pressure within the fuel tank increases in a predetermined range and solely movable away from said float valve to open said aperture when the pressure within the fuel tank increases beyond said predetermined range; and

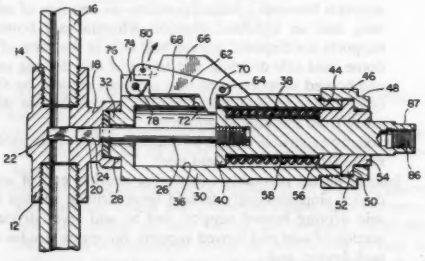
abutment means abuttingly engageable with said float valve for preventing said passageway from being closed by said float valve when the pressure within the fuel tank is higher than said predetermined range.

5,004,003

FIRE CONTROL VALVE WITH PIVOTAL LATCH

Charles H. Gray, Jr., 905 Canton Rd., Kingsport, Tenn. 37660

Continuation-in-part of Ser. No. 192,640, May 11, 1988, Pat. No. 4,890,635. This application Jan. 2, 1990, Ser. No. 459,975
Int. Cl.[5] F16K *31/64*
U.S. Cl. 137—75 10 Claims



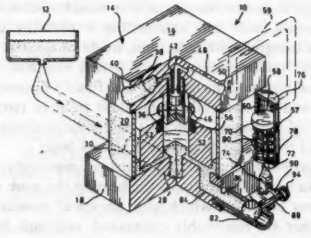
1. A fire control valve comprising a valve body having a flow passage therethrough and adapted to be connected to a flow line through which flammable material flows, said valve body including a valve seat, a valve member selectively engageable with the seat and forming a closure for the flow path when engaged with the seat, spring means biasing the valve member into engagement with the valve seat, means releasably retaining the valve member in a position to enable flow through the flow path, and temperature responsive means disabling the means retaining the valve member in flow enabling position to automatically release the valve member to move to a flow interrupting position in the event temperature conditions exceed a predetermined temperature, said spring means comprising a housing connected to the valve body, an actuator piston in said housing, means connecting the actuator piston to said valve member, a coil compression spring reacting against the piston and housing for moving the piston and valve member to engage the valve member with the valve seat, said means releasably retaining the valve member in a position to enable flow through the flow path including a pivotal latch mounted on the housing and engageable with the actuator piston to retain the actuator piston in a retracted position with the coil spring compressed, said temperature responsive means including a fusible link connecting a portion of the pivotal latch to the housing to retain the pivotal latch in engagement with the actuator piston with the fusible link being rupturable in response to predetermined high temperature conditions to enable the spring biased actuator piston to cam the latch to a released position thereby enabling the valve member to close.

5,004,004

AUTOMATIC DRAIN VALVE

Ernie W. Cummings, Knoxville, Tenn., assignor to Drain-All, Inc., Louisville, Tenn.

Filed Apr. 3, 1990, Ser. No. 503,721
Int. Cl.[5] F16K *31/34*
U.S. Cl. 137—195 3 Claims



1. An automatic drain valve for selectively discharging accumulations of condensables and foreign materials from a pneumatic system, said automatic drain valve comprising:

a reservoir defining a reservoir volume for collecting said condensables and foreign materials, said reservoir including a head portion and a base portion, said base portion being provided with a first passageway defining an inlet for being placed in fluid communications with said pneumatic system and defining a mouth opening into said reservoir volume through which said condensables and foreign materials are communicated to said reservoir volume, said reservoir further including a drainage conduit defining an outlet to facilitate the discharge of said condensables and foreign materials from said reservoir volume, whereby said first passageway and said drainage conduit provide flow through communications with said pneumatic system;

a pneumatic valve operator mounted on the exterior of said reservoir, said valve operator having an actuator arm reciprocatable from a retracted position to an extended position;

a pilot valve housing mounted within said reservoir volume of said reservoir, said pilot valve housing defining a cavity, said cavity being sealed against communication with said reservoir volume;

a pilot valve mounted axially within said cavity of said pilot valve housing, said pilot valve including a sensor tube, a valve seat at a first end of said sensor tube, and an axial moving magnetic valve plug of one polarity for selectively engaging said valve seat;

a buoyant float respondable to liquid in said reservoir volume, said float being provided with a hole for slidably receiving said pilot valve housing, said hole being disposed so as to be substantially coaxially aligned with said mouth of said first passageway, said float being movable within said reservoir volume from a lower position to an upper position;

an annular magnet mounted in said float proximate said pilot valve housing said annular magnet normally having a polarity opposite the polarity of said magnetic vale plug;

a drainage valve for said reservoir, said drainage valve having an inlet and an outlet, said inlet communicating with said outlet of said reservoir, said drainage valve also having a rotatable actuator stem for selectively opening and closing said drainage valve, said stem defining a threaded portion for releasably receiving a threaded fastener, said threaded fastener being tightened by rotating said fastener in a first rotational direction;

a linkage member for connecting said pneumatic valve operator to said drainage valve, whereby said pneumatic valve operator selectively opens and closes said drainage valve, said linkage member having a first end portion pivotally secured to said actuator arm of said valve operator and a second end portion secured to said actuator stem of said drainage valve with said threaded fastener whereby movement of said actuator arm from said retracted position to said extended position pivots said linkage member in a rotational direction corresponding to said first rotational direction for tightening said threaded fastener; and

pneumatic means connected between said pilot valve and said valve operator whereby said valve operator quickly opens said drainage valve when said float reaches said upper position and quickly closes said drain valve when said float reaches said lower position, said pneumatic means comprising a first conduit connecting said cavity of said pilot valve housing in fluid communication with a source of filtered air and a second conduit connecting said sensor tube in fluid communication with said pneumatic valve operator.

5,004,005

COMBINATION VALVE

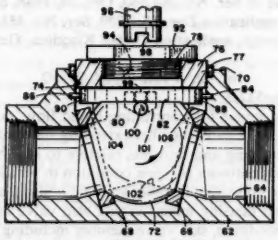
John G. Graves, 3107 Woodward Blvd., Tulsa, Okla. 74105

Continuation-in-part of Ser. No. 390,279, Aug. 7, 1989, Pat. No. 4,928,725. This application Apr. 9, 1990, Ser. No. 506,101

The portion of the term of this patent subsequent to May 29, 2007, has been disclaimed.

Int. Cl.[5] F16K *5/06, 15/03, 15/04*

U.S. Cl. 137—269.5 **12 Claims**



1. A combination valve comprising:

a valve body having a flow passageway therethrough and means to connect other fluid flow members thereto with such passageway, the body having an opening in the top thereof communicating with said passageway;

a rotating member rotatably received in said body said rotating member having a flow passageway therethrough which is alignable with the body flow passageway by rotatably positioning the member with said body passageway, the rotating member having a top opening therein communicating with said passageway therethrough;

a checking means within said rotating member and movable between a closed position blocking said passageway therethrough and an open position opening said passageway therethrough;

a bonnet member removably closing said body top opening and having a smaller diameter opening therethrough;

stem means rotatably received in said bonnet member and affixed within said valve body to said rotating member;

means external of said valve body to rotate said stem means and thereby said rotating member, whereby said member may be rotated to a first position to align the said passageway therethrough with said passageway through said valve body to permit the flow of fluid in one direction, said checking mechanism blocking fluid flow in the opposite direction, and said rotating member may be rotated to a second position to align the said passageway therethrough with said passageway through said valve body to permit the flow of fluid in the opposite direction, said checking mechanism blocking counter fluid flow, and rotated to a third position wherein said passageway therethrough is out of alignment with said passageway through said body to block fluid flow in either direction through said body, and wherein in said third position, said bonnet may be removed to expose said rotating member and to permit access to said checking mechanism.

5,004,006

TWO-WAY FLOW VALVE

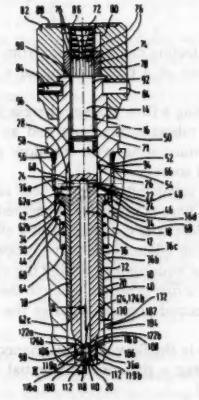
Rüdiger Jung, St. Ingbert, Fed. Rep. of Germany, assignor to Flutec Fluidtechnische Gerate GmbH, Fed. Rep. of Germany

Filed Mar. 8, 1990, Ser. No. 490,377

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1989, 3908377

Int. Cl.[5] G05D *7/01*

U.S. Cl. 137—501 **17 Claims**



1. A flow control valve, comprising:

an inlet and an outlet;

adjustment means for independently varying volume of throughput fluid flow between said inlet and said outlet;

first pressure means for receiving fluid pressure at said inlet, said first pressure means including a compensator bore extending through said adjustment means; and

correcting means, at said outlet, for regulating throughput fluid flow at said outlet, said correcting means including a

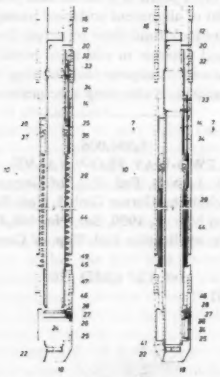
correcting number exposed to fluid pressure at said outlet applying a force thereon in a first direction and an accumulator applying a biasing force on said correcting member in said first direction, said correcting member also being exposed to the fluid pressure at said inlet through said compensator bore to apply force on said correcting member in a second direction opposite to said first direction.

5,004,007

CHEMICAL INJECTION VALVE

Dale V. Johnson, Metairie, and John R. Gordon, New Orleans, both of La., assignors to Exxon Production Research Company, Houston, Tex.

Filed Mar. 30, 1989, Ser. No. 330,680
Int. Cl.[5] G05D *7/01*
U.S. Cl. 137—501 **9 Claims**



1. A valve for injecting chemical fluid from a chemical fluid source into the bore of a tubing string of a well, the valve comprising:

a housing including a flow passage therein for communicating with the tubing string bore and an opening therethrough communicating with the flow passage and the chemical fluid source;

a valve closure including a flapper seat connected to the housing and a flapper pivotally connected to the housing, wherein the flapper is movable from a closed position to an open position wherein the valve is open;

an actuator in the housing for opening the valve closure and movable from a first position, wherein the valve closure is closed; to a second position wherein the valve closure is open;

a flow restrictor in the flow passage, connected to the housing, for creating a pressure differential across the flow restrictor; and

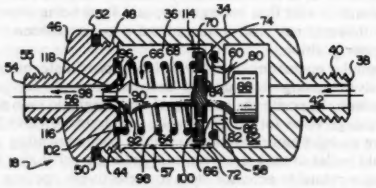
at least one piston connected to the actuator, in communication with the fluid source upstream of the flow restrictor, and adapted to move the actuator from its first position to its second position in response to the pressure of the chemical fluid upstream of the flow restrictor; whereby the pressure differential across the flow restrictor results in sufficient available pressure in the chemical fluid upstream of the flow restrictor to cause the piston to hold the valve open.

5,004,008

VARIABLE AREA REFRIGERANT EXPANSION DEVICE

Alan S. Drucker, Dewitt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 2, 1990, Ser. No. 502,896
Int. Cl.[5] G05D *7/01*
U.S. Cl. 137—504 **6 Claims**



1. An expansion device for metering the flow of refrigerant therethrough comprising:

a housing having a flow passage therethrough;

a partition disposed within said flow passage, said partition having a flow metering port extending therethrough, said partition dividing said flow passage into a high pressure portion and a low pressure portion;

an elongated member extending through said metering port, said elongated member and said metering port cooperating to define a flow metering passageway therebetween, said member being configured to vary the cross sectional area of said flow metering passageway in relation to the position of said member to said port;

means for supporting said elongated member within said flow passage and for controlling the axial position of said elongated member within said passage in response to the differential pressure between the refrigerant in said high pressure portion and said low pressure portion, said means for supporting and controlling including stop means forming a part of said elongated member, said stop means being located within said low pressure portion of said flow passage and being adapted to engage said partition to limit the axial movement of said elongated member in a direction going from said low pressure portion to said high pressure portion, and, means for biasing said stop means into engagement with said partition; and

means located within said low pressure portion of said flow passage for shutting off the flow of refrigerant through said expansion device when the pressure of refrigerant in said high pressure portion exceeds a predetermined value.

5,004,009

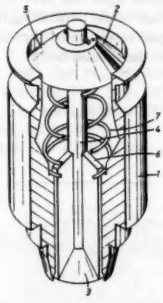
VALVE DEVICE FOR CONTROLLING LIQUID FLOW

Kevin R. Bunce, Baldock, England, assignor to Elopak A/S, Lierstranda, Norway

Continuation of Ser. No. 261,560, Oct. 24, 1988, abandoned. This application Dec. 15, 1989, Ser. No. 451,126
Claims priority, application United Kingdom, Oct. 26, 1987, 8725026
Int. Cl.[5] F16K *27/04, 23/00*
U.S. Cl. 137—512.3 **15 Claims**

1. A valve device for controlling liquid flow, comprising a tubular housing, a valve member extending substantially coaxially in said housing and movable relative to said housing and axially thereof between an open condition in which liquid can flow between said valve member and said housing and a closed condition, and biassing means urging said valve member into said closed condition, said valve member including an obturating portion which, in said closed condition, substantially obturates said tubular housing at a first location, said housing having an internal annular surface part of its internal surface which part gradually diverges outwardly at a gradually increasing angle to the axis of the housing in an axial direction away from said first location, without the diverging surface part discontin-

uing at any location along said part, the arrangement between such that said obturating portion, in its opening movement, sweeps in said axial direction along said surface and arrives at an equilibrium position at a variable, second location along said



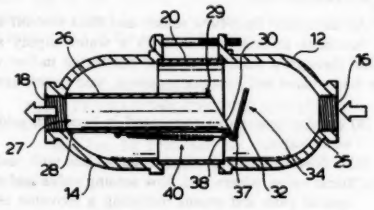
part in which liquid is flowing through between said obturating portion and said part and in which the total force tending to open said valve member is balanced by the total force tending to close the same.

5,004,010

HOSE RUPTURE VALVE

Wilfred Huet, 1259 Lozanne Crescent, Timmins, Ontario, Canada P4N 7C4

Filed Jan. 16, 1990, Ser. No. 465,948
Claims priority, application Canada, Sep. 29, 1989, 614651
Int. Cl.[5] F16K *17/24*
U.S. Cl. 137—513.3 10 Claims



1. A hose rupture valve, comprising:

(a) a housing having a longitudinal bore, an inlet port at one end of said housing, and an outlet port at the other end thereof, said ports being adapted so as to be coupled to high pressure fluid hoses;

(b) a vane pivotally mounted within the housing, said vane pivotally moving between an open position allowing flow of fluid through the housing and a closed position sealing off the outlet port when the hose downstream of the outlet port is opened to atmospheric pressure; and

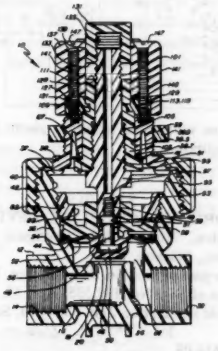
(c) a cylindrical conduit mounted within the housing along the longitudinal axis thereof, said conduit having a proximate end sealingly attached to the outlet port, a bore coaxial with the outlet port, and a distal end through which fluid passing through the valve may flow, the distal end of which is truncated at an acute angle, said vane being pivotally mounted to the forward most extension of the conduit.

5,004,011

POSITION INDICATING CONTROL VALVE

James C. Linder, Shorewood, and Jeffrey J. McKenzie, Watertown, both of Minn., assignors to Fluoroware, Inc., Chaska, Minn.

Filed Aug. 10, 1990, Ser. No. 565,623
Int. Cl.[5] F16K *37/00*
U.S. Cl. 137—556 19 Claims



1. A position indicating valve for controlling the flow of fluids which includes a flow housing with a valve seat and a valve poppet, comprising:

(a) a control housing adjoining the flow housing with a centrally located, nonrotating valve stem having inward and outward ends, the stem being connected to the valve poppet at its inward end and being threaded at its outward end with an intermediate portion being oppositely threaded;

(b) an operating handle rotatably mounted to the control housing with a configured central aperture therethrough into which the threaded outward end of the stem extends;

(c) a configured position indicator threadably mounted on the outward end of the stem within the aperture adapted to axially move inwardly and outwardly of the handle as the handle is rotated;

(d) a rotatable coupling interlockable with the handle and threadably mounted to and about the stem at the intermediate portion adapted to move the stem, the valve poppet and the indicator in the same axial direction with rotation of the operating handle.

5,004,012

AUTOMATIC WATER SHUT-OFF APPARATUS FOR BUILDING PROTECTION

David R. Bratten, 322 Greenway Rd., Memphis, Tenn. 38117

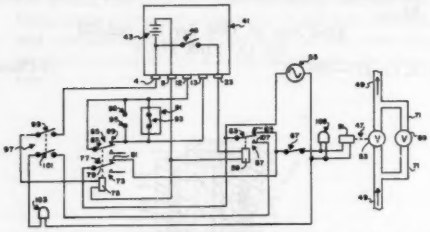
Continuation-in-part of Ser. No. 407,212, Sep. 14, 1989, Pat. No. 4,921,012. This application Apr. 25, 1990, Ser. No. 514,084
The portion of the term of this patent subsequent to May 1, 2007, has been disclaimed.
Int. Cl.[5] G08B *15/00*
U.S. Cl. 137—560 8 Claims

1. An automatic water shut-off apparatus for protection of a building from water damage comprising the combination of:

(a) an intrusion alarm system including means for arming said intrusion alarm system to provide an armed condition of said intrusion alarm system in which said building is monitored for intrusion and for disarming said intrusion alarm system to provide a safe condition in which time said building is not monitored for intrusion, and

(b) valve means inserted in the water supply of the building responsive to the condition of said intrusion alarm system for movement into an open position permitting the flow of water through said valve means when said intrusion alarm

system is in said safe condition and for movement into a closed position preventing the flow of water through said



valve means when said intrusion alarm system is in said armed condition.

5,004,013

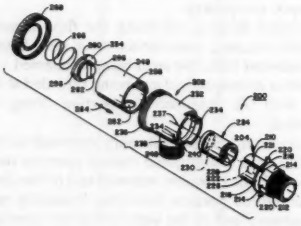
DRIPLESS COUPLING DEVICE

Brook J. Beaston, Wichita, Kans., assignor to Great Plains Industries, Inc., Wichita, Kans.

Continuation-in-part of Ser. No. 367,477, Jun. 16, 1989, which is a continuation of Ser. No. 180,355, Apr. 11, 1988, Pat. No. 4,844,450. This application Jun. 22, 1990, Ser. No. 542,735

Int. Cl.[5] F16L *37/28*

U.S. Cl. 137—614.05 **12 Claims**



1. A dripless coupling device for quick connection and disconnection of a flow conducting members comprising:

a male barrel having a threaded end, a shuttle end and a male barrel port disposed therebetween;

a collar member supported by the male barrel so as to be disposed between the threaded end and the male barrel port thereof, the collar member having a plurality of male tab members extending therefrom;

a male cylinder having a cylinder bore extending through one side thereof and a dial end, the male cylinder disposable within the male member such that the cylinder bore can be selectively moved for registery with the male barrel port;

a female body having a hollow post communicating with a female port formed in one side of the female body, the female body having locking tabs formed on one end thereof and an externally threaded end, the locking tabs adapted to lockingly engage the male tab members on the collar member when the male barrel is positioned within the female body such that in a locked position the male barrel port is in registery with the female port;

a dial retainer liner having a liner port extending through one side thereof, the dial retainer liner positionable within the female body such that the liner port is in registery with the female port of the female body;

a dialer member positionable within the dial retainer liner, the dialer member adapted to selectively rotate the male cylinder when the male cylinder and barrel member are disposed within the female body and secured therein via interconnection of the male tab members and the locking tabs so that the cylinder bore of the male cylinder can be brought into registery with the female port;

seal means supported by the female body for sealingly engaging the dialer member when the barrel member and male cylinder are disconnected from the female body; and

means to form a fluid-tight seal between the seal means and the dialer member while permitting the dialer member to be retracted upon insertion of the male cylinder and the male barrel into the female body.

5,004,014

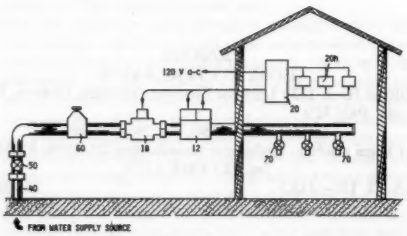
AUTOMATIC FLUID FLOW SENSOR AND FLUID SHUT-OFF SYSTEM

Richard C. Bender, 24031 Mariano St., Woodland Hills, Calif. 91367

Filed Jun. 29, 1990, Ser. No. 545,595

Int. Cl.[5] F16K *31/02*

U.S. Cl. 137—624.12 **10 Claims**



1. An automatic fluid-flow sensor and fluid shut-off system that functions in combination with a water supply source applied through a main water pipe connected in-line with a main water valve and pressure regulator, said system comprising:

(a) an electrical valve connected in line with said main water valve,

(b) a flow-sensing valve connected in-line with said electrical valve, where said flow sensing valve includes an optical path and means including a movable element that remains below the optical path when there is no fluid flow through said flow-sensing valve which causes a no-flow signal to be produced and that interrupts the optical path when there is a fluid flow which causes a flow trigger signal to be produced, and

(c) an electronics control unit having the means to:

(1) control the application of an a-c voltage that turns on said electrical valve,

(2) receive and process the no-flow or flow trigger signals from said flow sensing valve,

(3) start a programmable timer circuit that is directly coupled to receive the no-flow and flow trigger signals from said flow-sensing valve such that when the flow trigger signal is received, upon the lapsing of a preset time, a signal, that is free of microprocessor control, is produced that removes the a-c power being applied to said electrical valve which causes said valve to close and stop the fluid flow.

5,004,015

DIRECTIONAL CONTROL DEVICE

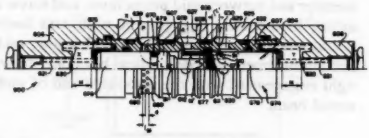
Reinhard Amrhein, Frammersbach; Walter Heid, Neustadt, and Günther Muschong, Wuerzburg, all of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Fed. Rep. of Germany

Division of Ser. No. 73,364, Jul. 10, 1987, Pat. No. 4,832,081, which is a continuation of Ser. No. 800,074, filed as PCT EP85/00074 on Mar. 1, 1985, abandoned. This application May 17, 1989, Ser. No. 353,066

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407653; Mar. 1, 1984, 8406441[U]; Nov. 14, 1984, 3441650; Nov. 14, 1984, 8433398[U]

Int. Cl.[5] F15B *13/04*

U.S. Cl. 137—625.68 **13 Claims**



1. A direction spool valve comprising:

a main housing member,

a bushing sealingly mounted in said main housing member,

a center bore in said bushing,

a control spool reciprocally mounted in said center bore and adapted to guide pressurized fluid to one of at least one user and to a tank,

a pressure guide element on said control spool,

a bushing seal located in a bushing groove of said bushing for cooperation with said pressure guide element so as to provide a sealing effect for the same, wherein the pressure guide element is an integral part of the control spool and is arranged above a recess in the control spool,

radial bores in the pressure guide element for guiding fluid in a substantially radial direction onto said bushing seal,

wherein an axial width of an area of the radial bores is smaller an axial length L' of an annular land formed between the bushing groove receiving the bushing seal in the bushing and an adjacent annular recess in the bushing,

control bores arranged in the bushing for cooperation with a spool seal in the control spool element being arranged adjacent to a land having a width L which is larger than an axial width of the control bores.

5,004,016

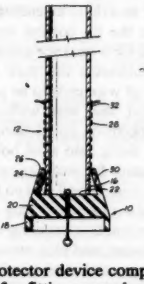
PIPE THREAD PROTECTOR DEVICE

Justin J. Kliewer, 404 S. First, Fairview, Okla. 73737

Filed Jan. 10, 1990, Ser. No. 463,256

Int. Cl.[5] B65D *59/06*

U.S. Cl. 138—96 T **2 Claims**



1. A pipe thread protector device comprising:

a shoe constructed for fitting around, and abutting against, the threaded end of an elongated section of pipe having a thread on one end thereof, said shoe being constructed of an elastomeric material and including a frustoconical portion positioned for surrounding the threads on the pipe when the pipe end abuts an internal surface in the shoe; and

an elongated tubular woven wire mesh constriction sleeve having one of its ends connected to said shoe and positioned relative to said shoe for extending coaxially around a threaded pipe when the frustoconical portion of said shoe extends around the threads of said pipe, said woven wire mesh constriction sleeve being constructed so that said sleeve undergoes a reduction in diameter when a tensile force is applied to the sleeve tending to elongate the sleeve, and undergoing an increase in diameter when a compressive force is applied to opposite ends of the sleeve.

5,004,017

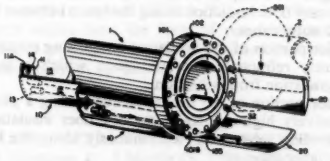
PIPE STABILIZING SYSTEM FOR UNDERWATER USE IN JOINING FLANGED PIPE SECTIONS

Loran L. White, 629 E. School St., Lake Charles, La. 70605

Filed Apr. 18, 1985, Ser. No. 724,511

Int. Cl.[5] F16L *1/04*

U.S. Cl. 138—106 **7 Claims**



1. A stabilizing system for use in joining flanged pipe sections together in an underwater environment, comprising:

a first flanged pipe section located in the water a significant depth;

a second flanged pipe section to be flanged together to said first pipe section located adjacent to said first pipe section;

at least one flange stabilizing element attached to said first flanged pipe section, said flange stabilizing element being attached to a flange of said first pipe section, said flange stabilizing element(s) having a pipe fastening portion with a flange stabilizing portion affixed thereto and extending out from said pipe fastening portion and past said first pipe section a distance substantially in excess of the thickness of one flange, providing laterally spaced lines of stabilization adjacent to the flange of said first pipe section at a different vertical position than a bottom center-point of said first pipe section thereby defining a curved stabilizing area consistent with the curvature of a flange of said second pipe section and having sufficient strength to adequately resist movement of the flange of said second pipe section past it; said flange stabilizing portion providing means for guiding and stabilizing said second pipe section in making up the underwater connection between said pipe sections using at least one diver, the stabilizing element preventing the second flanged pipe section from moving around without restriction adjacent the flange interfaces thereby assisting the diver(s) in connecting the flanged pipe sections; said flange of said first flanged pipe section having a plurality of bolt holes in it; said pipe fastening portion including a circular opening aligned with a flange bolt hole; and there being further included a locking key with downwardly extending, vertically disposed ends inserted through said circular opening and the flange bolt hole with which it is aligned, effectively locking the stabilizing element to the flange of said first pipe section; said locking key being removable from said circular opening and the aligned bolt hole after the flanged pipe sections are connected together.

5,004,018

INSULATED EXHAUST PIPE AND MANUFACTURE THEREOF

David W. Bainbridge, Littleton, Colo., assignor to Manville Corporation, Denver, Colo.

Filed Jul. 31, 1989, Ser. No. 386,754
Int. Cl.[5] F16L 9/14; F01N 3/00
U.S. Cl. 138—149 7 Claims

1. An insulated pipe for use in the exhaust system of a vehicle powered by an internal combustion engine, comprising:

an inner metallic tube;

an outer metallic tube spaced from and concentrically arranged with respect to the inner metallic tube; and

refractory fiber insulation filling the space between the inner and outer tubes;

a major portion of the insulation comprising relatively low density refractory fiber insulation which is subject to degradation from vibration;

a minor portion of the insulation comprising a plurality of relatively high density refractory fiber insulation strips extending substantially continuously along the length of the inner tube;

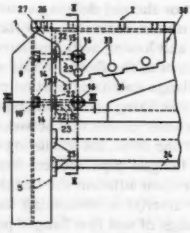
the high density strips being circumferentially spaced from each other and having a radial thickness to provide a means to inhibit movement of the low density fiber during operation of the vehicle to thereby prevent degradation thereof.

5,004,019

HARNESS FRAME WITH DETACHABLE CORNER CONNECTIONS

Daniel Blontrock, Roeselare, Belgium, assignor to N.V. Verbrugge, Roeselare, Belgium

Filed Sep. 6, 1989, Ser. No. 403,453
Claims priority, application Belgium, Sep. 9, 1988, 8801039
Int. Cl.[5] D03C 9/06
U.S. Cl. 139—91 18 Claims



1. A harness frame for weaving machines, comprising:

(a) a pair of spaced vertical beams (1);

(b) at least one horizontal beam (2) extending between said vertical beams, each of said vertical beams including in horizontal cross-section a central portion (6), an attachment portion (8) intermediate said central portion and the associated horizontal beam, and a guide portion (7) on the opposite side of said central portion from said attachment portion, said portions extending longitudinally of said vertical beam; and

(c) means connecting the ends of said horizontal beam with the associated vertical beam, respectively, said vertical beam attachment portion being bifurcated to define a pair of leg portions (12) which terminate adjacent the associated end of said horizontal beam, the extremities of said leg portions including inwardly directed projections (13), respectively, said connecting means including:

(1) a connecting member (5) mounted between said leg portions and in engagement with the adjacent surfaces of said inwardly directed projections, and

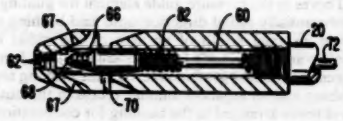
(2) at least one screw (3,4) having at one end an enlarged head portion (11) arranged in an opening (10) contained in said vertical beam central portion, said enlarged head portion being in engagement with the adjacent end of said connecting member, said screw extending at its other end through a bore contained in said connecting member and between said projections, said screw terminating in threaded engagement with said horizontal beam, whereby upon tightening said screw, said connecting member and said vertical beam are drawn into tight engagement with the associated end of said horizontal beam.

5,004,020

WIRE TWISTING APPARATUS

Charles I. Meinershagen, Redding, Calif., assignor to NewTech Products, Inc., Palo Cedro, Calif.

Continuation of Ser. No. 146,464, Jan. 21, 1988, Pat. No. 4,880,038. This application Nov. 14, 1989, Ser. No. 436,286
The portion of the term of this patent subsequent to Nov. 14, 2006, has been disclaimed.
Int. Cl.[5] B21F 7/00, 15/04
U.S. Cl. 140—93.6 2 Claims



1. A wire twisting apparatus capable of one handed operation, said apparatus comprising:

a handle adapted to be grasped by the hand of a user;

a shaft coupled to said handle, said shaft having an axial bore and a wire receiving apertured tip portion with a tapered wall region forming a seat;

tapered plug means retractably received in said tip portion in normal contact with said seat, the tapers of said wall region and said plug means being substantially identical, said wall region and said plug means each having a taper angle lying in the range from about 5° to about 30°, said tip portion having an axially extending open slot intersecting the aperture in the tip portion and extending longitudinally therefrom for a distance along said tip portion and a depth which intersects the bore in the tip portion for enabling a pair of wire ends to be positioned between said plug means and said seat without requiring insertion through said apertured tip portion;

means extending along said axial bore and coupled to said tapered plug means for enabling retraction of said tapered plug means relative to said seat so that a pair of wire ends can be received between said plug means and said seat via said slot, said retraction enabling means including means for normally biasing said plug means toward said seat; and

means for retaining a pair of wire ends received between said plug means and said seat, said retaining means including a roughened portion of said plug means and a roughened portion of said seat, each roughened portion having a ridged surface with peripherally extending contour lines.

5,004,021

ARRANGEMENT FOR CONVEYING POWDER TO THE BARREL OF A GAS DETONATION APPARATUS

Vladimir J. Ulyanitsky, ulitsa Tereshkovoi, 6, kv. 129; Tamara P. Gavrilenko; Jury A. Nikolaev, both of ulitsa Ilicha, 19, kv. 9, and Alexandr I. Buteev, ulitsa Zolotodolinskaya, 15, k. 39, all of Novosibirsk, U.S.S.R.

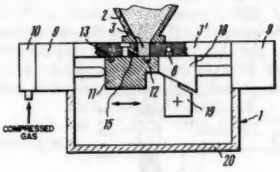
PCT No. PCT/SU89/00008, § 371 Date Sep. 18, 1989, § 102(e) Date Sep. 18, 1989, PCT Pub. No. WO89/06570, PCT Pub. Date Jul. 27, 1989

PCT Filed Jan. 18, 1989, Ser. No. 415,369

Claims priority, application U.S.S.R., Jan. 19, 1988, 4409712

Int. Cl.[5] B65B *1/08*; B67D *5/00*

U.S. Cl. 141—67 3 Claims



1. Apparatus for feeding powder to the barrel of a gas detonation apparatus comprising a housing (1), a hopper (2) containing the powder and communicating with an interior space of the housing (1), and a slide valve (11) provided inside the housing (1) and having a powder-metering recess (12) and a drive (9) which moves the slide valve from a first extreme position to a second extreme position, the housing (1) having passages (3, 4, 7) for feeding compressed air and for conveying the powder from the hopper (2) to the powder-metering recess (12) and from the powder-metering recess (12) to the barrel (19), said passages having openings (5, 6, 8) in an internal wall of the housing characterized in that the slide valve (11) is positioned in an upper part of the housing (11) and means (14) is provided resiliently urging the slide valve against said wall of the housing having the openings (5, 6, 8) of the passages (3, 4, 7), the powder-metering recess (12) being located at a surface of the slide valve (11) in contact with said wall of the housing (1), a shut-off unit (18) being further provided which is connected to the slide valve (11) and which blocks one of said openings (8) of the passage (7) for conveying the powder from the powder-metering recess (12) to the barrel (19') in the first extreme position of the slide valve (11), and the powder-metering recess in the second extreme position of the slide valve (12) communicates with the opening (8) of the passage (7) for conveying the powder to the barrel (19').

5,004,022

METHOD AND AN ARRANGEMENT FOR FILLING LARGE SACKS

Börje Carlsson, Hjälmarsvik, PL 7178, S-732 00 Arboga, Sweden

PCT No. PCT/SE88/00175, § 371 Date Sep. 29, 1989, § 102(e) Date Sep. 29, 1989, PCT Pub. No. WO88/07965, PCT Pub. Date Oct. 20, 1988

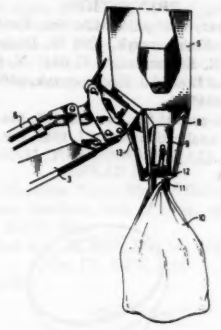
PCT Filed Apr. 8, 1988, Ser. No. 435,409

Claims priority, application Sweden, Apr. 14, 1987, 8701568

Int. Cl.[5] B66F *9/00*; B65B *3/16*

U.S. Cl. 141—114 5 Claims

2. An arrangement for filling large sacks (10) with manageable material with the aid of a mechanical shovel, for the purpose of transporting or storing said material, comprising a movable shovel loader (1) equipped with driving seat a tiltable mechanical shovel (5) which can be raised and lowered with the aid of lifting arms and which has an open side through which the shovel can scoop up material, characterized in that a shovel defining wall which is located opposite said open side and which forms the bottom of the shovel when said open side faces upwards, is at least partially funnel-shaped (8); the funnel-shaped part includes a passageway through which said material can flow from said shovel through said passageway (9) is provided with a closure means (12); in that the arrangement further comprises means (11) for attaching a sack (10) to the



shovel (5) so that said passageway (9) connected thereto projects into the mouth of the sack (10); and in that said sack attachment means have the form of suspension means (11) which enable a filled sack (10) to be lifted and transported whilst hanging from the shovel.

5,004,023

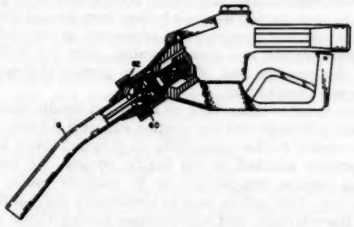
GASOLINE NOZZLE WITH EMERGENCY SHUT-OFF

Anthony Monticup, Jr., 3 Martin Ct., Clifton Park, N.Y. 12065, and Franklin L. Gubernick, 1420 Nott St., Schenectady, N.Y. 12308

Filed Mar. 30, 1990, Ser. No. 494,127

Int. Cl.[5] B67D *5/373*

U.S. Cl. 141—208 9 Claims



1. An improved liquid dispensing nozzle of the type having a liquid inlet, a nozzle body having a manually operated liquid control valve and a liquid outlet, wherein the improvement comprises:

an emergency shut-off means operatively connected to the nozzle and including means for stopping the flow of liquid should the liquid outlet be separated from the nozzle body;

an automatic shut-off means operatively connected to the nozzle which functions to stop liquid flow once a container that is receiving liquid from the nozzle outlet becomes full; and

wherein the automatic shut-off means includes a venturi means and wherein the emergency shut-off means includes a valve means biased towards a closed position and wherein the venturi means includes means for maintaining said valve means in an open position that allows liquid flow whereby separation of said liquid outlet from said nozzle body causes the venturi means to at least partially move away from a centerpoint of said nozzle body and

thereby allow the valve means to move to a closed position which stops the flow of liquid.

5,004,024

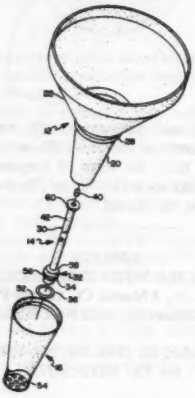
SEALABLE FUNNEL FOR MEASUREMENT AND SPILL PREVENTION

Leonard D. Rezmer, 1135 S. 9 Mile Rd., Kawkawlin, Mich. 48631; John R. Kaczmarczyk, 4099 W. Dodge, Clio, Mich. 48420; Gerald R. Kaczmarczyk, G 6447 N. Saginaw, Clio, Mich. 48420, and Donald J. Kaczmarczyk, 6460 Estrelle, Mt. Morris, Mich. 48458

Continuation-in-part of Ser. No. 325,308, Mar. 17, 1989, abandoned. This application Nov. 27, 1989, Ser. No. 441,942

Int. Cl.[5] B65B *39/00*; **B67C** *11/00*

U.S. Cl. 141—298 **4 Claims**



1. A sealable funnel assembly comprising:

(a) a funnel body comprising a stem portion and a cup portion, the stem portion having a hollow bore formed therethrough, the cup portion being connected to one end of the stem portion and communicating with the hollow bore, the opposite end of said stem portion defining a valve seat therewithin;

(b) a core member comprising an elongated handle portion extending through said cup portion and stem portion, the core member further comprising an enlarged lower sealing portion attached to the handle portion, the lower sealing portion dimensioned to fit sealingly inside the valve seat of the hollow bore to temporarily prevent fluid flow therethrough, said core member having a vent passage formed therethrough; and

(c) sealing means surrounding said stem portion and removably secured thereto for sealingly engaging with an inlet of a receptacle, said sealing means including a portion extending over the opposite end of said stem portion to limit downward movement of said sealing portion with respect to said funnel body.

5,004,025

METHOD AND APPARATUS FOR SLOWLY DISPENSING A SOLUTION FOR UNCLOGGING DRAINS

David L. Robbins, 504 Cleveland St., Rocky Mount, N.C. 27803

Filed Sep. 27, 1989, Ser. No. 413,207

Int. Cl.[5] B08B *3/08*

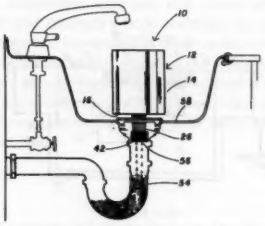
U.S. Cl. 141—364 **5 Claims**

2. An anti-clogging solution container and drop dispenser device containerizing dispensing anti-drain clogging solution into an inlet of a clogged drain comprising:

(a) a container having a main body portion with a side wall structure, a top, and a bottom;

(b) a dispenser section connected to the top of the main body portion, wherein the dispenser section provides a means for dispensing an anti-drain clogging solution into a drain pipe inlet in a relative slow manner over an extended period of time whereby the clogs and sediment within the drain are exposed to and are slowly dissolved by the solution;

(c) the dispensing section including a neck extending from the top and a drain dispenser secured to the neck. the neck having a remote end and having threads that extend substantially the entire distance from the remote end of the neck to the top of the container; and



(d) an adjustable support collar threaded on the neck between the top and the dispenser and movable back and forth thereon between the top and the dispenser for supporting the container above the drain inlet, the collar having a circumferential bearing surface for engaging and resting upon the drain inlet and wherein the position of the container and dispenser can be adjusted by rotating the supprt collar about the neck such that the container and dispenser can both be moved up and down with respect to the drain inlet.

5,004,026

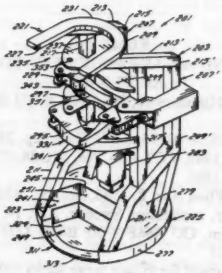
FELLING HEAD

Charles MacLennan, 153 Cote St., Charles, Hudson, Quebec J0P 1J0; Douglas D. Hamilton, 5858 Cote des Neiges, Suite 215, Montreal, Quebec H3S 1Z1, and Robert M. Palfy, 320 5th Street, Laval, Quebec H7N 1Z4, all of Canada

Filed Oct. 6, 1989, Ser. No. 417,765

Int. Cl.[5] A01G *23/08*

U.S. Cl. 144—3 D **6 Claims**



1. A felling head having: a frame; tree cutting means at the bottom of the frame; two vertically spaced-apart, U-shaped, fixed cradles on the frame above the tree cutting means, each cradle having a closed base and an open mouth opening away from the frame; a retaining arm pivotally mounted on the frame between the cradles; means for moving the retaining arm between an open position where it is to one side of the mouth of the cradles and a closed position where it extends across the

mouth of the cradles so as to close the cradles and to thereby loosely hold a cut tree within the cradles; a pair of grapple arms pivotally mounted on the frame between the cradles, one grapple arm on each side of the cradles; means to move the grapple arms between an open position where each is to one side of the cradles, and a closed position where each extends across the cradles to overlap and to tightly hold a cut tree against the base of the cradles; and means on the frame below the cradles for supporting a cut tree by its butt end while loosely retained in the cradles and before it is held by the grapple arms.

5,004,027

BISCUIT JOINER

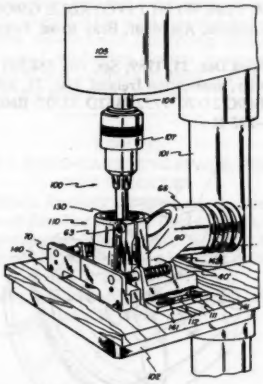
John G. Legler, Huber Heights; Harold E. Folkerth, Dayton; David D. Flora, Arcanum, and Barry L. Hile, Tipp City, all of Ohio, assignors to Shopsmith, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 392,183, Aug. 10, 1989, Pat. No. 4,926,916. This application May 18, 1990, Ser. No. 525,950

The portion of the term of this patent subsequent to May 22, 2007, has been disclaimed.

Int. Cl.[5] B27C *5/00, 1/00*

U.S. Cl. 144—136 R **15 Claims**



1. Apparatus for cutting slots in wood workpieces to be oined by disk-like biscuits of predetermined dimensions inerted in such slots, comprising:

(a) a power tool including a frame supporting a worktable and drive means above said worktable having a drive spindle depending therefrom in perpendicular relation with said worktable,

(b) a rotary saw blade carried by an arbor drivingly connected with said drive spindle and thereby fixed laterally with respect to said worktable,

(c) a housing mounted on said tool in enclosing and laterally fixed relation with said saw blade and having an open front aligned with said saw blade,

(d) said housing and said saw blade being so proportioned that in said mounted positions thereof, said saw blade projects through said open front of said housing,

(e) means for effecting relative vertical adjustment of said drive means and said worktable to establish a predetermined space between said saw blade and said worktable,

(f) a guide for workpieces to be slotted having a face for engagement by each such workpiece,

(g) means mounting said guide on said housing at said open front thereof for linear movement toward and away from said saw blade,

(h) said guide having a slot therethrough aligned with and for receiving said saw blade therethrough,

(i) stop means establishing an outer limit position of said guide wherein said saw blade does not project beyond the plane of said guide face, and

(j) stop means for establishing an inner limit position of said guide establishing the maximum depth of the slot cut by said saw blade in a workpiece moved on said worktable with said guide to said inner limit position,

(k) whereby upon movement of said guide toward said housing by a workpiece sliding on said worktable in engagement with said guide, said saw blade will cut a slot in said workpiece at the level determined by said means for effecting relative adjustment of said drive means and said worktable.

5,004,028

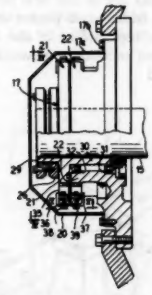
SHEAR HUB

James Adams, Memphis, Tenn.; Richard Gobel, Scappoose, and Bryan Lanham, Gresham, both of Oreg., assignors to Beloit Corporation, Beloit, Wis.

Filed Jun. 25, 1990, Ser. No. 543,255

Int. Cl.[5] B27C *1/00*

U.S. Cl. 144—176 **14 Claims**



8. An apparatus for slicing wood chips such as in a pulp preparation procedure comprising in combination:

a power input rotary drive shaft means;

a rotor having anvil means for carrying wood chips against cutting knives and adapted to be driven by said shaft;

a power rotation clutch means connected between said shaft and said rotor accommodating relative rotation with forced stalling of the rotor;

the clutch means including;

a driven hub secured to the rotor;

a driving hub secured to the shaft;

and shear pin means between said hubs of a strength to transmit normal rotational operating power and to shear upon forced stalling of the rotor.

5,004,029

SAW TABLE APPARATUS

William C. Garner, P.O. Box 552, Tonganoxie, Kans. 66086

Filed Apr. 16, 1990, Ser. No. 509,709

Int. Cl.[5] B25H *1/16, 1/06*

U.S. Cl. 144—287 **1 Claim**

1. A saw table apparatus comprising, in combination,

a table plate member defining a planar top surface spaced from and overlying a planar bottom surface, and

a first wing plate hingedly mounted to the plate member at a first end of the plate member arranged orthogonally to the plate member in a first position and aligned with the plate member in a lowered second position, and

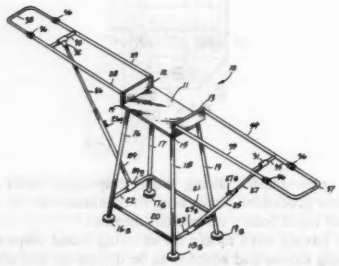
a second wing plate hingedly mounted at a second end of the plate member opposed to the first end, wherein the second end is arranged parallel to the first end, with a second elongate hinge pivotally mounting the second wing plate to the second end of the plate member, wherein the second wing plate is arranged orthogonally relative to the

plate member in a first position and aligned with the plate member in a second position, and

a first, second, third, and fourth leg member each integrally mounted and downwardly extending from the bottom surface of the plate member, and each leg member of an equal length to support the plate member at a spaced relationship relative to lower terminal ends of each leg member, and

a rung framework fixedly mounted to the first, second, third, and fourth leg members, wherein the rung framework defines a rung plane underlying and parallel to the top surface of the plate member, the rung framework including a first end rung underlying and parallel the first end of the plate member, and a second end rung underlying and parallel the second end of the plate member, and

the first wing plate includes a first framework mounted orthogonally to and extending exteriorly of a rear surface of the first wing plate, and a second framework mounted orthogonally to and extending exteriorly of a rear surface of the second wing plate, wherein the first and second framework defines a first and second framework plane, and the first and second framework planes are aligned coextensively relative to one another when the first and second wing plates are in the first position, wherein the first and second framework planes are arranged to and spaced above the top surface of the table plate member when the first and second frameworks are in the raised first position, and



the first framework includes a first and second tube each parallel relative to one another and defined by an equal length, wherein each first and second tube are fixedly mounted to the rear surface of the first wing plate, and the first and second tubes include a friction collet mounted to each first and second tubes from the first wing plate, and the first and second tubes each receive through the respective friction collet mounted to each first and second tube a first "U" shaped extension member leg of a first "U" shaped extension member reciprocatably mounted within the first and second horizontal tube, and

the second framework includes a third and fourth horizontal tube fixedly and orthogonally mounted to the rear surface of the second wing plate, and the third and fourth horizontal tube includes a friction collet mounted to each free terminal end of each horizontal tube spaced from the second wing plate, and the third and fourth horizontal tube receives a second "U" shaped extension member leg of a second "U" shaped extension member through each collet associated with each third and fourth horizontal tube, and

the first and second horizontal tube includes a first brace orthogonally and fixedly mounted between the first and second tube, including a first wing leg member pivotally mounted to the first brace, the first wing leg member telescopingly received within a first tube leg, wherein the first tube leg is pivotally mounted at its lower terminal end to the first end rung, and

the third and fourth horizontal tube includes a second brace fixedly and orthogonally mounted therebetween, including a second wing leg member pivotally mounted at its upper terminal end to the second brace, and wherein a lower terminal end of the second wing leg member telescopingly receivable within a second tube leg, the second tube leg including a lower terminal end, the lower terminal end of the second tube leg pivotally mounted orthogonally relative to its longitudinal length to the second end rung, and

further including a "U" shaped yoke, the "U" shaped yoke including a bottom leg fixedly mounted to the bottom surface of the plate member, and a second leg spaced above and parallel to the top surface of the plate member, and the second leg slidably receiving a saw therealong, wherein the "U" shaped yoke is removably mounted to the plate member, and

the apparatus further includes a power miter saw assembly mounted on the top surface of the plate member, wherein the power miter saw includes a support base, the support base defined by a predetermined height, the predetermined height equal to a further height defined by each first and second wing plate, the power miter saw spaces above the first and second framework when mounted on the plate member.

5,004,030

PNEUMATIC TIRE WITH PIVOTABLE GROUND PADS

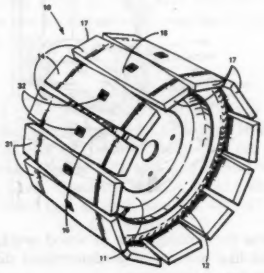
Hugh R. McLaughlin, Aberdour, Bray Road, Foxrock, County Dublin,

Filed Dec. 21, 1989, Ser. No. 454,591

Claims priority, application Ireland, Dec. 21, 1988, 3835/88

Int. Cl.[5] **B60C** *27/20, 7/22;* **B62D** *55/07;* **B60D** *15/10*

U.S. Cl. 152—225 R **8 Claims**



1. A traction device, comprising: a pneumatic tire for mounting on a wheel hub, the tire having a plurality of ground engaging pads disposed around the periphery of the tire, each pad being capable of at least a limited degree of rotational displacement about a radial axis relative to the tire, whereby the tire may turn through the limited rotation relative to any pad currently in ground contact, and means for returning each pad to its undisplaced position when the pad has moved out of contact with the ground.

5,004,031

PNEUMATIC TIRE WITH A STRIP REINFORCING LAMINATE HAVING FILAMENTS ARRANGED TOGETHER IN AN UNDULATING FORM

Kuninobu Kadota; Yoshihide Kohno, and Hiroyuki Koseki, all of Kodaisa, Japan, assignors to Bridgestone Corp., Tokyo, Japan

Filed Mar. 7, 1989, Ser. No. 320,422

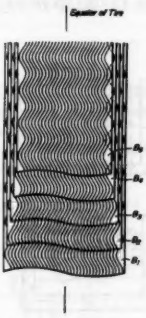
Claims priority, application Japan, Mar. 9, 1988, 63-53672; Sep. 19, 1988, 63-232254

Int. Cl.[5] **B60C** *9/28, 9/22;* **B32B** *25/02*

U.S. Cl. 152—538 **27 Claims**

10. A pneumatic tire comprising; a toroidal carcass extended between at least a pair of bead cores as a casing reinforcement; a belt reinforcing a crown portion of said toroidal carcass

comprised of a strip reinforcing laminate comprising of plural strips with each strip comprising filaments arranged together in an undulating form in the same plane as a reinforcing element and covered with a high molecular weight material having a modulus of elastitcity lower than that of the reinforcing element, each reinforcing element in each of said strips



having interlaced portions on at least two reinforcing elements in the adjoining strip, and said reinforcing elements in all of said strips being aligned in the same direction and phases in said undulating form between said reinforcing element in one of said strips and said reinforcing element in another adjoining strip are shifted so that a shifting quantity is ½–½λ where λ is a wavelength of said reinforcing element.

5,004,032

COVER FOR A LOAD-CARRYING SPACE, PREFERABLY FOR VEHICLES

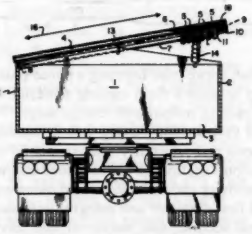
Helge L. Pedersen, Frobjerg DK-5560, Aarup, Denmark

Continuation of Ser. No. 163,284, Dec. 23, 1987, abandoned, which is a continuation-in-part of Ser. No. 851,139, Mar. 20, 1986, abandoned. This application May 25, 1989, Ser. No. 357,664

Claims priority, application Denmark, Jul. 13, 1984, 3597/84

Int. Cl.[5] B60P *7/04*

U.S. Cl. 160—84.1 **5 Claims**



1. Cover for a load-carrying space, preferably for vehicles and comprising a flexible cover material adapted to being moved mechanically across an open load-carrying space and to being removed to provide an open load-carrying space, said cover material being secured at intervals to a number of supporting strips having a longitudinal direction extending across the load-carrying space, and said strips capable of sliding at right angles to their longitudinal direction, one supporting strip forming a drawstrip driven by a driving means, the supporting strips at each end being controlled in guide rails, the guide rails adapted to being situated at end wall of the load-carrying space, each guide rail being divided into a first and a second rail part, said first and second rail parts being connected by means of a hinge, the first part of each guide rail, at an end lying most distant from the hinge, adapted being fixed to an upper edge of a first side wall of the load-carrying space such that a longitudinal direction of said first part forms an acute angle to a bottom of the load-carrying space with the hinge being positioned considerably higher up than the side walls of the load-carrying space, means being provided for turning said second part of each guide rail around the hinge between a position where a free end is adapted to abut an upper edge of the other side wall and a position where said second part of each guide rail extends in continuation of said first part, one side edge of the cover material being attached at said free end of the second part of the guide rails, the opposite side edge being attached to the drawstrip, and wherein the drawstrip is placed at the side of the cover material turning toward the first guide rail part and wherein the driving means for drawing are endless chains, driven by a joint driving shaft driven by a motor.

5,004,033

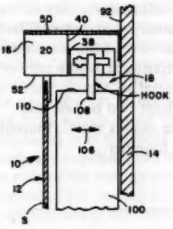
GAP BRIDGING ASSEMBLY FOR USE WITH VERTICAL BLIND ASSEMBLIES

Frank M. Stipkovits, 4584 Lower Mountain Rd., Lockport, N.Y. 14094

Filed May 4, 1990, Ser. No. 519,673

Int. Cl.[5] E06B *9/38*

U.S. Cl. 160—178.1 **5 Claims**



1. In combination:

(A) a vertical blind assembly which includes

(1) a headrail mounted on a wall adjacent to a window

(2) a plurality of vertically oriented slats pendently supported from said headrail and spaced from said window to define a gap; and

(B) a gap-bridging assembly which includes

(1) a bracket assembly which has

(a) an L-shaped body having a short leg and a long leg,

(b) said short leg having adhesive on one surface attaching said short leg to a rear surface of the headrail,

(c) said long leg extending from said headrail and contacting said wall,

(d) said long leg including

(i) an elongated slot,

(ii) two spaced apart mounting projections, and

(iii) a U-shaped section having two legs and projection-receiving slots defined in said legs which slidably receive said spaced apart mounting projections,

(2) a J-shaped hook slidably mounted on said long leg in said elongated slot, said hook including a top portion and a curved bottom portion, and a T-shaped projection mounted on said body portion, said T-shaped projection including a body attached at one end to said hook top portion and extending through said long leg elongated slot and a cap portion on said body that engages said long leg adjacent to said long leg slot on a side of said long leg that is opposite to the side on which said hook is located; and

(3) an elongated gap-bridging vane having a hook-receiving slot defined in one and extending from said L-shaped bracket body between said vertical blind slats

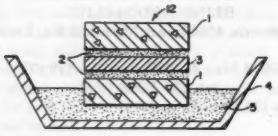
and said wall in said gap and being oriented to be perpendicular to a plane containing said wall, vane being pendently supported from said hook for movement therewith.

5,004,034

METHOD OF SURFACE BONDING MATERIALS TOGETHER BY USE OF A METAL MATRIX COMPOSITE, AND PRODUCTS PRODUCED THEREBY

Eugene S. Park, Hockessin, Del., and Michael K. Aghajanian, Bel Air, Md. and Christopher R. Kennedy, Newark, Del. assignors to Lanxide Technology Company, LP, Newark, Del.

Filed Nov. 10, 1988, Ser. No. 269,307
Int. Cl.[5] B22D *19/14*
U.S. Cl. 164—97 45 Claims



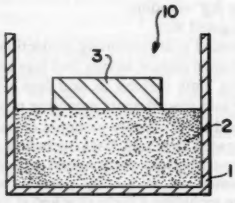
1. A method for bonding a plurality of bodies, comprising:
providing a substantially nonreactive filler between at least a portion of at least two bodies which are to be bonded;
spontaneously infiltrating at least a portion of the filler with molten matrix metal to form a metal matrix composite between said at least two bodies; and
cooling said molten matrix metal, thereby bonding said at least two bodies together.

5,004,035

METHOD OF THERMO-FORMING A NOVEL METAL MATRIX COMPOSITE BODY AND PRODUCTS PRODUCED THEREFROM

John T. Burke, Hockessin, and Marc S. Newkirk, Newark, both of Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Filed Nov. 10, 1988, Ser. No. 269,375
Int. Cl.[5] B22D *19/14*
U.S. Cl. 164—97 40 Claims



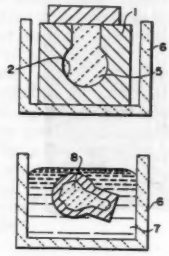
1. A method for making a metal matrix composite, comprising:
forming a permeable mass consisting essentially of a substantially non-reactive filler;
spontaneously infiltrating the filler with molten matrix metal to form an infiltrated mass; and
thermo-forming said infiltrated mass at a temperature above the liquidus temperature of the matrix metal.

5,004,036

METHOD FOR MAKING METAL MATRIX COMPOSITES BY THE USE OF A NEGATIVE ALLOY MOLD AND PRODUCTS PRODUCED THEREBY

Kurt J. Becker, Newark, Del., assignor to Lanxide Technology Company, LP, Newark, Del.

Filed Nov. 10, 1988, Ser. No. 269,295
Int. Cl.[5] B22D *19/14*
U.S. Cl. 164—97 43 Claims



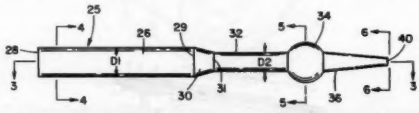
1. A method for making a metal matrix composite, comprising:
forming a cavity in a solid matrix metal;
placing a substantially non-reactive filler in the cavity;
inducing the filler to become self-supporting and to conform substantially to the shape of the cavity;
melting the matrix metal; and
spontaneously infiltrating at least a portion of the filler with the molten matrix metal thereby forming a metal matrix composite body.

5,004,037

LONG SPAN SPRUE TUBE FOR INVESTMENT CASTING

Ronald Castaldo, 19 Pitts Ave., Mastic, N.Y. 11950

Filed Aug. 7, 1989, Ser. No. 390,104
Int. Cl.[5] B22C *7/02, 9/04*
U.S. Cl. 164—244 6 Claims



1. A long span sprue tube forming a sprue passage in a casting investment to pass a fluid casting material into a pattern cavity in said casting investment, comprising:
a cylindrical first section having a first outside diameter, a free first end and an axially spaced second end;
a tapered second section having a wider end and an axially spaced narrower end, said wider end being equal in diameter to said first diameter and integral with said second end of said first section, said narrower end having a second outside diameter smaller than said first outside diameter;
a cylindrical third section having axially spaced third and fourth ends, said third end being integral with said narrower end of said tapered section, said third section having a uniform diameter equal to said second diameter;
a bulbous portion formed integrally with said fourth end, said bulbous portion forming a chamber constituting a reservoir for said casting material in said sprue passage, said bulbous portion having a fifth end spaced from said fourth end; and
a tapered tip section integral with said fifth end and having a free end adapted for attachment to a pattern prior to embedment thereof in said casting investment, all of said sections being disposed in axial alignment to form an axially straight sprue passage in said casting investment

communicating with said pattern cavity therein when said pattern and said sprue tube sections are all burned out of said casting investment, whereby said fluid casting material can flow smoothly without turbulence through said sprue passage to said pattern cavity, and whereby velocity of said casting material entering said sprue passage increases in successive steps in said sprue passage, until said casting material reaches said pattern cavity to fill the same completely.

5,004,038

DEGASSING APPARATUS FOR MOLD

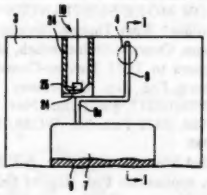
Minoru Kuriyama, Yamaguchi, Japan, assignor to UBE Industries, Ltd., Ube, Japan

Filed Nov. 28, 1989, Ser. No. 442,213

Claims priority, application Japan, Nov. 29, 1988, 63-299447; Dec. 6, 1988, 63-306885

Int. Cl.[5] B22D *17/14*

U.S. Cl. 164—305 **5 Claims**



1. A degassing apparatus for a mold comprising:

a degassing valve located at an end portion of a degassing passage extending from a mold cavity, wherein said degassing passage has a bent portion;

an acoustic wave detecting unit, arranged midway along said degassing passage, for detecting an acoustic wave generated when a molten metal collides against a wall surface of said passage, and thereby detecting passing of the molten metal, wherein said acoustic wave detecting unit is disposed adjacent to said bent portion; and

a valve closing unit for closing said valve when a detecting signal level is higher than a reference signal level.

5,004,039

REFRACTORY MATERIAL

Roy C. Feagin, Boca Raton, Fla., assignor to Remet Corporation, Chadwicks, N.Y.

Continuation of Ser. No. 246,029, Sep. 14, 1988, abandoned, which is a continuation of Ser. No. 110,059, Oct. 15, 1987, abandoned, which is a continuation of Ser. No. 941,527, Dec. 17, 1986, abandoned, which is a continuation of Ser. No. 693,068, Jan. 22, 1985, abandoned, which is a division of Ser. No. 487,704, Apr. 21, 1983, abandoned, which is a continuation of Ser. No. 246,315, Mar. 23, 1981, Pat. No. 4,415,673. This application Mar. 9, 1989, Ser. No. 320,877

The portion of the term of this patent subsequent to Nov. 15, 2000, has been disclaimed.

Int. Cl.[5] B22C *9/02*

U.S. Cl. 164—361 **20 Claims**

1. A refractory casting mold having a shape necessary to produce a desired cast article comprising the reaction product obtained by mixing an acid-stabilized, aqueous, colloidal zirconia sol, with an active refractory material capable of gelling said sol in an amount effective to gel said sol after a suitable non-gel working period, to thereby form an aqueous mixture capable of gelling within a predetermined working period, shaping said aqueous mixture prior to gelation thereof into the desired casting mold shape, without grinding and while retaining water, permitting said aqueous mixture to gel in the presence of at least some water, thereafter allowing water to evaporate and to produce the casting mold.

5,004,040

METHOD OF CONTINUOUS CASTING

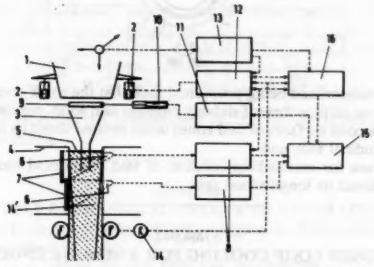
Fritz-Peter Pleschiutschnigg, Duisburg; Lothar Parschat, Ratingen; Hans U. Franzen; Manfred Pfluger, both of Duisburg, and Josef Glaser, Düsseldorf, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Feb. 14, 1990, Ser. No. 480,099

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1989, 3905328

Int. Cl.[5] B22D *11/16, 11/18*

U.S. Cl. 164—453 **1 Claim**



1. A method of continuously casting steel in which a melt is introduced, through a movable immersion nozzle having an outer lower edge, from a movable distributor into a mold of rectangular cross-section having an upper edge, a distance between the broad sides of about 40 to about 100 mm and a distance between the narrow sides of between about 200 and about 2000 mm, and from which mold the casting is withdrawn, the melt introduced into the mold defining a bath of steel therein, said method comprising the steps of:

(a) controlling the start of the casting process in connection with the withdrawal of the casting by

(1) starting the withdrawal of the casting upon reaching a desired height of the surface of the bath of the steel in the mold, and

(2) driving the casting from the mold at a desired casting removal speed via a control element in a predetermined manner;

(b) measuring the position of the bath level as it ascends in the mold during the continuous casting;

(c) adjusting the position of the immersion nozzle in relation to the ascending bath level from a first position to a desired operating position by changing the position of the distributor, and

(d) determining the desired operating position of the immersion nozzle with respect to the upper edge of the mold as a function of the temperature of the steel melt, the quality of the steel, the K-value of the solidification of the casting, the speed of withdrawal of the casting and the bath level, so as to establish, during the casting, a spacing of the outer lower edge of the immersion nozzle between a solidification front of the casting and the bath level.

5,004,041

HEAT TRANSFER SYSTEM WITHOUT MASS TRANSFER

Marc J. Jaeger, Gainesville, Fla., assignor to The University of Florida, Gainesville, Fla.

Division of Ser. No. 199,355, May 26, 1988, Pat. No. 4,880,049. This application Aug. 23, 1989, Ser. No. 397,407

Int. Cl.[5] F28D *19/00*

U.S. Cl. 165—8 **1 Claim**

1. A heat-transfer system comprising:

at least a pair of zones constructed of heat-conductive material, each of said zones having a first solid surface adapted for positioning at respective locations of differing temper-

atures between which it is desired to transfer heat and each having a second solid, continuous surface adapted to slidably engage the exterior solid, continuous surface of a cylindrical element rotating about its longitudinal axis;

a cylindrical element having at least the solid, continuous exterior surface thereof constructed of a heat-conductive

material and being positioned such that the solid, continuous surface thereof slidably engages said solid, continuous second surfaces of said zones when rotated about its longitudinal axis; and

means for establishing rotation of said cylindrical element about its longitudinal axis.

5,004,042

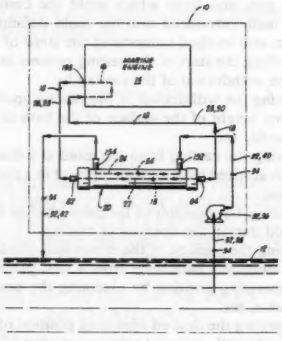
CLOSED LOOP COOLING FOR A MARINE ENGINE

Lee W. McMorries, IV, and James B. Saatkamp, both of Stillwater, Okla., assignors to Brunswick Corporation, Skokie, Ill.

Filed Oct. 2, 1989, Ser. No. 415,566

Int. Cl.[5] B63H *21/10, 21/38;* F28F *9/06, 21/06*

U.S. Cl. 165—41 **13 Claims**



1. A marine power system having closed loop cooling, comprising:

a marine engine having a cooling fluid passage defined therein through which a cooling fluid stream may pass;

a shell and tube heat exchanger having a tube side flow path and a shell side flow path defined therein;

cooling fluid conduit means for connecting said cooling fluid passage to said tube side flow path so that said cooling fluid stream from said engine is directed through said tube side flow path of said heat exchange;

a raw water supply means for directing a raw water stream from a body of water through said shell side flow path and then back to said body of water, so that excess heat from said engine is transferred to said cooling fluid stream, the from said cooling fluid stream in said tube side flow path to said raw water stream in said shell side flow path of said heat exchanger, and then to said body of water as said raw water stream returns thereto;

wherein said heat exchanger includes an outer shell and a bundle of tubes received in said shell, said shell side flow path being defined between and contacting an interior surface of said shell and outer surfaces of said tubes, said outer shell being constructed of a non-metallic corrosion resistant material;

wherein said bundle of tubes includes a plurality of straight parallel tubes held between two spaced bundle bases, said tubes having open ends adjacent each of said bundle bases;

wherein said heat exchanger further includes a hot and a cold end ca connected to first and second ends of said shell, respectively, said hot and cold end caps having a tube side inlet and a tube side outlet, respectively, defined therein;

wherein said tubes are constructed to a metal suitable for efficient heat transfer; and

wherein said bundle bases and said end caps are made of non-metallic corrosion resistant materials.

5,004,043

INTERNAL TUBULAR FALLING FILM APPARATUS FOR THE EVAPORATION OF LIQUIDS AND FOR THE ABSORTION OR DEGASSING OF SOLUTIONS OF TWO OR MORE SUBSTANCES

Vinko Mucic, Walldorf; Kurt Thieme, Bergisch-Gladbach, and Jürgen Engelmann, Overath-Steinenbrück, all of Fed. Rep. of Germany, assignors to TCH Thermo-Consulting-Heidelberg GmbH, Heidelberg, Fed. Rep. of Germany

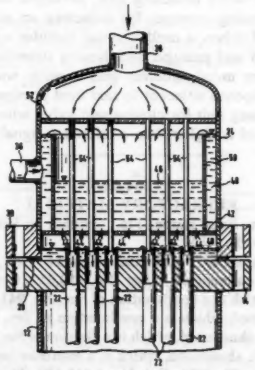
PCT No. PCT/EP88/00217, § 371 Date Nov. 2, 1988, § 102(e) Date Nov. 2, 1988, PCT Pub. No. WO88/07653, PCT Pub. Date Oct. 6, 1988

PCT Filed Mar. 17, 1988, Ser. No. 274,932

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1987, 3709652

Int. Cl.[5] F28D *3/04, 3/02*

U.S. Cl. 165—118 **6 Claims**



1. Apparatus for the evaporation of liquids or for the absorption or degassing of solutions of two or more substances, having a completely closed upright pressure tank provided with at least one inlet and one outlet, through which tank a thermal transfer fluid can flow, the interior of the tank containing a plurality of vertical tubes parallel to and spaced from one another whose ends are brought sealingly through horizontal plates closing off the pressure tank at the bottom and at the top such that they open into a bell disposed in a pressure-tight manner on the bottom and top of the pressure tank, the upper ends of the tubes protruding into the bell each by the same amount above the upper side of the top horizontal plate and an inlet for liquid or solution being provided on the upper bell plus a connection for the infeed and outfeed of evaporated liquid or gaseous solution component, and an outlet for liquid or liquid solution being provided on the bottom bell, while at a distance above the upper mouths of the tubes and below the

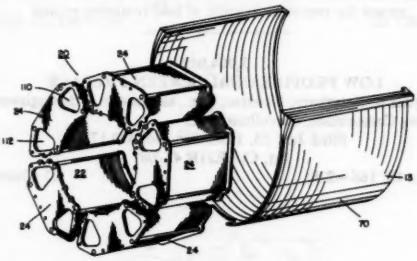
liquid or solution inlet a dividing plate parallel to the top plate of the pressure tank is inserted into the upper bell and contains a plurality of perforations of small diameter offset from the mouths of the tubes, characterized in that, at a distance above the perforated dividing plate (42; 142) and above the inlet (36; 136) for the liquid or solution, and below the connection (38; 138) for feeding in or carrying away evaporated liquid or gaseous solution component, an additional dividing plate (52; 152) is inserted into the bell (24; 124), and that the space formed between the perforated dividing plate and the additional dividing plate contains a number of vertical tubes (54; 154) aligned with the tubes passing through the pressure tank, whose ends are brought sealingly through the lower perforated dividing plate and the additional upper dividing plate.

5,004,044

COMPACT RECTILINEAR HEAT EXHANGER

John J. Horgan, Wethersfield, and Val S. Ociepka, Bridgeport, both of Conn., assignors to Avco Corporation, Providence, R.I.

Filed Oct. 2, 1989, Ser. No. 415,990
Int. Cl.[5] F28F *9/22, 3/00*; F02C *7/10*
U.S. Cl. 165—145 **19 Claims**



19. An annular heat exchanger comprising:

a plurality of rectilinear heat transfer portions, each portion having a first fluid inlet side, an opposite first fluid outlet side, and two lateral sides;

means for conduiting a second fluid into and out of said heat transfer portions comprising lateral side portions located between heat transfer portion lateral sides and having a general triangular shape with second fluid inlet and outlet conduits therein, said first fluid inlet sides defining a center aperture and said lateral side portions being substantially separate from said center aperture such that said first fluid inlet sides form substantially the entire first fluid inlet area to the heat exchanger and the location of the lateral side portions allow the heat exchanger to have a relatively small size.

5,004,045

VEHICLE RADIATOR WITH CLAMPING FIXTURE TO REDUCE DEFORMATION DURING BRAZING AND METHOD OF MAKING

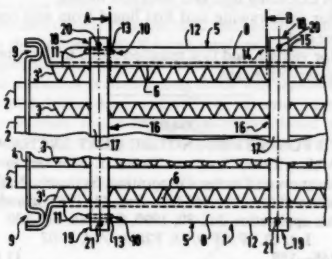
Philippe Le Gauyer, Paris, France, assignor to Valeo Thermique Moteur, Le Mesnil-St-Denis, France

Filed Mar. 8, 1990, Ser. No. 490,297
Claims priority, application France, Mar. 20, 1989, 89 03588
Int. Cl.[5] F28D *1/00*; B23K *31/00*
U.S. Cl. 165—149 **9 Claims**

1. A method of manufacturing a heat exchanger comprising a bundle including a plurality of tubes, a plurality of fins alternating with said tubes, at least one end beam terminating said bundle and extending along it, and at least one collector plate closing an end of the bundle, said at least one end beam comprising outwardly projecting portions thereof, the method including the steps of:

providing deformable means on said projecting portions of said at least one end beam;

disposing a clamping means in the vicinity of said at least one collector plate and in line with said deformable means;



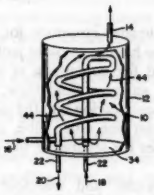
and securing the components of the bundle together by welding.

5,004,046

HEAT EXCHANGE METHOD AND APPARATUS

Brian C. Jones, Windsor, Conn., assignor to Thermodynetics, Inc., Windsor, Conn.

Filed Jun. 11, 1990, Ser. No. 535,755
Int. Cl.[5] F28D *7/12*
U.S. Cl. 165—156 **22 Claims**



6. Apparatus for transferring thermal energy between a pair of isolated liquids comprising:

reservoir means for temporarily storing a quantity of a first liquid;

heat exchanger means for defining a pair of fluidically isolated flow paths, said heat exchanger means being at least in part immersed in said reservoir, said heat exchanger means including:

an inner conduit, said inner conduit defining a first flow path for a second liquid, said first flow path having first and second ends;

an intermediate conduit, said intermediate conduit in part comprising a spirally fluted tube in intimate contact with the exterior of said inner conduit whereby a double wall separation is defined between the interior of said inner conduit and the exterior of said fluted tube, said fluted tube cooperating with said inner conduit to define a first spiralled space therebetween; and

an outer conduit, the interior of said outer conduit being in intimate contact with said fluted tube, said outer conduit cooperating with said fluted tube to define a second spiralled space between said outer conduit and fluted tube, said second space comprising a portion of a second flow path, said outer conduit being sealed to said intermediate conduit at a first end of said outer conduit, said second flow path communicating with the interior of said reservoir means;

means for delivering said first fluid to the interior of said outer conduit at a point adjacent to said outer conduit first end whereby said first fluid flows along said second flow path and is discharged into said reservoir means;

means for delivering said second fluid to said inner conduit at a first end of said first flow path, said delivering means extending into said reservoir means;

means for receiving said second fluid from said inner conduit at the second end of said first flow path, said receiving means extending into said reservoir means;

means for withdrawing said first liquid from said reservoir means; and

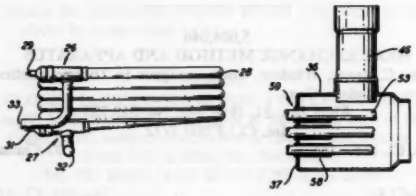
means for venting said first spiralled space to the exterior of said reservoir means.

5,004,047

HEADER FOR A TUBE-IN-TUBE HEAT EXCHANGER

Paul R. Meier, Tyler, Tex., and Brian D. Mueller, Syracuse, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Continuation of Ser. No. 365,880, Jun. 14, 1989, abandoned.
This application Jul. 30, 1990, Ser. No. 561,500
Int. Cl.[5] F28F *9/18;* F28D *7/14, 7/02*
U.S. Cl. 165—158 11 Claims



8. An improved header structure for a tube-in-tube heat exchanger of the type having an outer jacket for containing an outer fluid flow and for containing at least one inner tube adapted to conduct an inner fluid flow, a header providing outer fluid flow communication into the jacket and to the outer surface of said at least one inner tube, and a manifold plate disposed in the header for separating the outer and inner fluid flows, comprising:

a single piece header and manifold plate combination wherein the manifold plate is integrally formed as one end of said header and has at least one opening formed therein for receiving said at least one inner tube to be secured therein wherein said at least one inner tube has a nominal thickness which is less than 0.016 inches and wherein said manifold plate is relatively thin so as to be susceptible to deformation;

a cap which is secured to said header one end to form a manifold for containing the inner fluid flow and for providing fluid communication with a conduit to be connected thereto; and a reinforcing sleeve disposed around said at least one inner tube near said at least one opening to restrict said tube from internal deformation when said manifold plate is caused to deform.

5,004,048

APPARATUS FOR INJECTING DISPLACEMENT PLUGS

Robert E. Bode, 14911 Wunderlich, Apt. #1903, Houston, Tex. 77069

Filed Nov. 15, 1989, Ser. No. 437,458
Int. Cl.[5] E21B *33/16*
U.S. Cl. 166—70 6 Claims

1. An apparatus for injecting cement displacement plugs into a well bore for cementing casing comprising:

(a) a well bore casing with an upper inlet and a lower outlet;

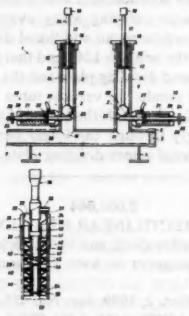
(b) a manifold comprising a housing provided with an inlet and an outlet connected by a flow passage through the housing;

(c) at least one launching cylinder comprising a housing provided with an interior bore connected with said flow passage;

(d) a spring loaded injection piston mounted within said launching housing;

(e) pick up means for insertion into said interior bore;

(f) releasable retaining means for selectively releasing said pick up means;



(g) means for remote mounting of said manifold and means for connection of said manifold to said well bore; and,

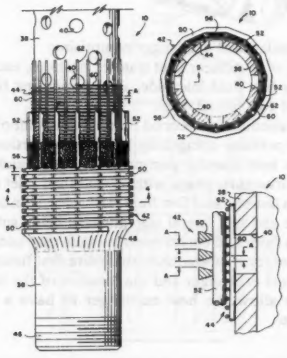
(h) means for a remote actuation of said injection piston, and means for remote actuation of said retaining means.

5,004,049

LOW PROFILE DUAL SCREEN PREPACK

Bryant A. Arterbury, Houston, Tex., assignor to Otis Engineering Corporation, Carrollton, Tex.

Filed Jan. 25, 1990, Ser. No. 470,177
Int. Cl.[5] E21B *43/08*
U.S. Cl. 166—228 11 Claims



1. A sand screen assembly for separating particulated material from formation fluid comprising, in combination:

a perforated mandrel;

an inner wire screen mounted onto said perforated mandrel, said inner wire screen having circumferentially spaced, longitudinally extending inner rib wires engaging said mandrel and an inner screen wire wrapped externally about said inner rib wires in a longitudinally spaced pattern, said inner screen wire being welded to said inner rib wires at substantially all points of contact therewith, thereby defining longitudinally spaced inner screen apertures for conducting fluids through said inner screen;

a fluid-porous, particulate-restricting member mounted onto said mandrel in radially spaced relation with respect to said inner wire screen, thereby defining a prepack annulus

therebetween said fluid-porous, particulate-restricting member including circumferentially spaced, longitudinally extending outer rib wires and a screen wire wrapped externally about said outer rib wires in a longitudinally spaced pattern thereby defining longitudinally spaced screen apertures for conducting formation fluids through said outer screen, said longitudinally extending outer rib wires being disposed in said prepack annulus; and,

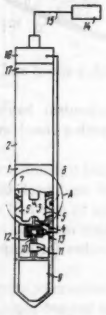
a permeable gravel deposit disposed within said prepack annulus.

5,004,050

METHOD FOR WELL STIMULATION IN THE PROCESS OF OIL PRODUCTION AND DEVICE FOR CARRYING SAME INTO EFFECT

Olga N. Sizonenko, ulitsa Inzhenernaya, 13, kv. 2, Nikolaev; Rafkhat A. Maxutov, Leninsky prospekt, 67, kv. 164, Moscow; Pavel P. Maljushevsky, Oktyabrsky prospekt, 33, kv. 41; Georgy G. Gorovenko, ulitsa Skorokhodova, 54, kv. 20, both of Nikolaev; Alexei V. Sokolov, prospekt Mira, 112, kv. 255, Moscow; Diana N. Lyapis, ulitsa Naberezhnaya, 5, kv. 20, Nikolaev; Vladimir I. Schekin, prospekt Lenina, 10a, kv. 97, Nikolaev, and Natalya I. Kuskova, Oktyabrsky prospekt, 5, kv. 27, Nikolaev, all of U.S.S.R.

Filed Jan. 12, 1990, Ser. No. 457,828
Int. Cl.[5] E21B *43/24*
U.S. Cl. 166—248 **22 Claims**



1. A method for well stimulation in the process of oil and/or gas and/or gas-condensate production, which comprises periodically generating shock waves propagating through the producing formation by initiating an electric discharge in a fluid filling in the well in a gap between electrodes positioned in the well, introducing a current-conducting fluid, comprising a dielectric fluid and a current-conducting powder material, into the gap between the electrodes and initiating the electric discharge between the electrodes.

5,004,051

METHOD AND MEANS FOR CLEANSING AND STORING DRILL CUTTINGS FROM DRILLING OPERATIONS IN THE SEA BOTTOM

Finn Rosendahl, Jar; Svein Fjeld, Oslo, both of Norway; Mamdouh M. Salama, and Michael P. Gillen, both of Ponca City, Okla., assignors to Norwegian Contracts A/S, Stabekk, Norway and Conoco Inc., Ponca City, Okla.

Filed Sep. 12, 1989, Ser. No. 406,355
Int. Cl.[5] E21B *43/34*
U.S. Cl. 166—357 **22 Claims**

1. A subsea storage structure for storing drill cuttings from a drilling operation in a sea bottom and for separating oil and other contaminating fluids from such drill cuttings, said structure comprising:

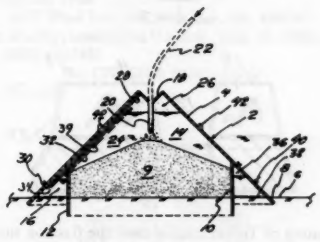
a generally upwardly converging tank defined by an outer shell having an interior;

an inner wall sealingly connected to said shell inwardly thereof and dividing said interior into a central chamber and an annular chamber surrounding said central chamber;

wherey said tank may be positioned on the sea bottom with said chambers filled with sea water;

upper inlet means in said tank for introducing drill cuttings into said central chamber such that the drill cuttings settle to the bottom thereof while displacing sea water therein upwardly above such settled drill cuttings and such that oil and other contaminating fluids will separate from the settled drill cuttings and will rise upwardly through and accumulate above the sea water positioned above the settled drill cuttings, thereby performing a first separation step;

a pipe sealingly extending through said inner wall and having an inlet end at an intermediate level of said central



chamber and an outlet end at an intermediate level of said annular chamber and forming means for passing sea water displaced by the drill cuttings entering said central chamber from said central chamber to be said annular chamber, whereby any oil and other contaminating fluids remaining in such sea water passed into said annular chamber by said pipe will rise up and accumulate in an upper portion of said annular chamber above the sea water therein, thereby performing a second separation step; and

outlet means, extending from said annular chamber and communicating with ambient sea water surrounding said structure, for discharging from said annular chamber to the ambient sea water that sea water displaced by the sea water entering said annular chamber through said pipe after separation of any oil and other contaminating fluids from that sea water.

5,004,052

HORSESHOE

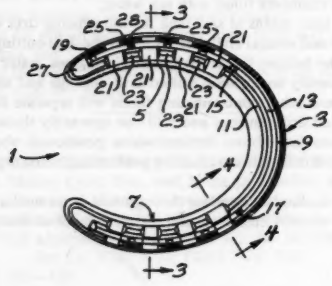
Arthur I. Appleton, 22 Indian Creek Island, Miami Beach, Fla. 33154

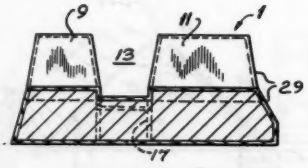
Filed Oct. 28, 1988, Ser. No. 263,904
Int. Cl.[5] A01L *1/00*
U.S. Cl. 168—4 **7 Claims**

1. An improved horseshoe comprising:

a. a traction surface having a plurality of calks, the traction surface including a toe portion and integrally formed side

portions extending from opposite sides of the toe portion; and





b. a coating of Teflon formed over the traction surface, whereby dirt and mud will not build up on the traction surface.

5,004,053

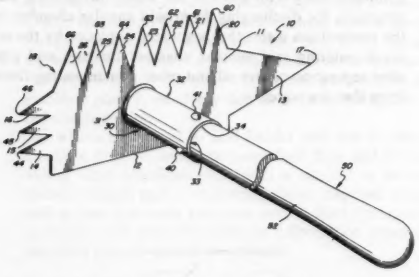
MULTIPLE USE CULTIVATING TOOL

Gregg Martell, 8644 Cavel St., Downey, Calif. 90242

Filed Oct. 10, 1989, Ser. No. 418,552

Int. Cl.[5] A01B *1/20*

U.S. Cl. 172—375 **9 Claims**



1. A multiple use cultivating tool comprising:

a generally planar tool head having first and second surfaces said second surface having a flat generally rectangular-shaped tamping surface free of protrusions extending over a majority of said second surface;

a handle support extending from said first surface;

an elongated handle joined to said handle support;

a first plurality of teeth extending from a first side of said tool head;

a second plurality of teeth extending from a third side of said tool head;

a straight edge portion extending from a fourth side of said tool head; and

an elongated pick blade extending from a second side of said tool head,

said tamping surface, said first plurality of teeth, said second plurality of teeth, said straight edge portion and said pick blade being coplanar.

5,004,054

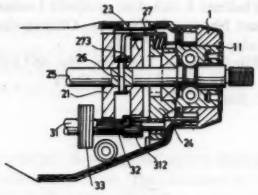
ELECTRIC DRILL WITH SPEED AND TORQUE CONTROL

Dony Sheen, Taya Hsiang, Taiwan, assignor to Regitar Power Tools Co., Ltd., Taichung Hsien, Taiwan

Filed Jul. 2, 1990, Ser. No. 547,033

Int. Cl.[5] B23Q *5/00*; F16D *7/06*

U.S. Cl. 173—12 **2 Claims**



1. An electric drill with a speed and torque control comprising:

a speed control mechanism having a transmission axle fixedly connected with a chuck and a hole for receiving a pin;

a pinion disposed on said transmission axle and having a neck on one side thereof, said neck being provided with two notches for adapting to one half of said pin;

a gear rotatably slidably mounted on said transmission axle and having two notches for adapting to the other half of said pin;

a pusher having a protuberance extending at one end and on outward leg and an inward leg extending from the other end and disposed above said pinion in a way that said legs are located as close as possible so that when said pusher is moved leftward, said outward leg will push said gear leftwards thereby separating the notches of said pinion from said said pin;

resilient means forcing said pinion and gear to engage with said pin;

a torque control mechanism having a driven gear connected with an output shaft of a motor and a plurality of recesses in each of which is received a steel ball;

a clutch having a plurality of recesses corresponding to the recesses of said driven gear in each of which is also received a steel ball;

a spline having threads meshed with said gear and a gear engaged with said pinionn and fixedly connected at the end with clutch;

a pressing member disposed on said spline;

resilient means fitted between said clutch and said pressing member for urging said clutch against said driven gear;

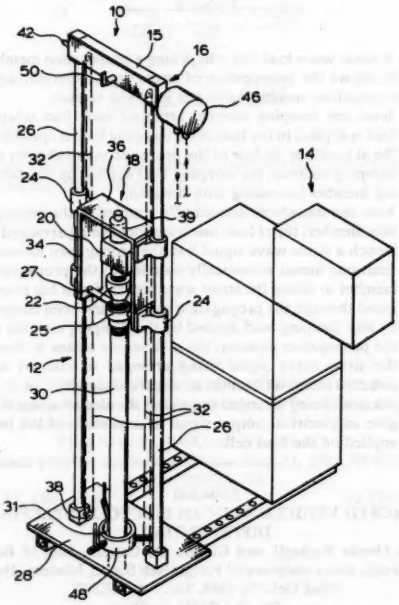
an adjuster ring rotatably mounted on said transmission axle, said adjuster ring having at the inner side with an inner rack and an outer rack adapting to said pusher and an end of said pressing member so that when said adjuster ring is turned, said gear will be moved to engage or disengage from said transmission axle thereby adjusting output speed and said pressing member will be urged against or away from said driven thereby adjusting output torque.

5,004,055

VIBRATORY CORE DRILL APPARATUS FOR THE RECOVERY OF SOIL OR SEDIMENT CORE SAMPLES

John Porritt, Picton, and Hugh Scott, Wellington, both of Canada, assignors to Meta-Probe Inc., Picton, Canada

Filed Apr. 14, 1989, Ser. No. 338,716
Int. Cl.[5] E21B 7/24, 25/00
U.S. Cl. 175—20 13 Claims



1. A vibratory core drill apparatus for applying force to a sampling tube, comprising

(a) a drill stand;

(b) a carriage assembly mounted to the drill stand in a vertically sliding fashion;

(c) carriage drive means for driving the carriage assembly up and down by the application of vertical force thereto;

(d) vibratory drive means contained within the carriage assembly for applying a vertical vibratory force to the sampling tube;

(e) coupling means for coupling and decoupling the sampling tube to the vibratory drive means without rotation of the vibratory drive means; and

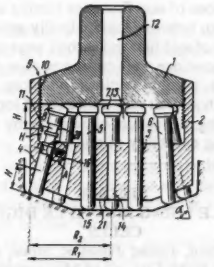
(f) support means mounted within the carriage assembly for supporting the coupling means within the carriage assembly wherein the support means comprises a yoke having an annular portion sized to receive the coupling means and two axial side arms pivotally mounted to the carriage assembly so as to allow the support means to pivot about the longitudinal axis of the side arms.

5,004,056

PERCUSSION-ROTARY DRILLING TOOL

Yakov A. Gofkhman, ulitsa Gladkova, 14, kv. 49, Krasnoyarsk; Georgy M. Krjukov, ulitsa 2 Sinichkina, 11, kv. 145, Moscow; Melis I. Onotsky, ulitsa Pavla Andreeva, 28, kv. 332, Moscow; Georgy M. Sorokin, Leninsky prospekt, 67, korpus 2, kv. 334, Moscow; Alexei V. Filatov, ulitsa Startovaya, 31, kv. 51, Moscow; Viktor V. Tsarapkin, Leninsky prospekt, 91, kv. 351, Moscow; Vadim P. Yakimov, ulitsa Gilyarovskogo, 36, kv. 74, Moscow; Gennady A. Smirnov, ulitsa Partizana Zheleznyaka, 24, kv. 6, Krasnoyarsk; Ivan I. Nikiforov, ulitsa 60-letia Oktyabrya, 44, kv. 74, Krasnoyarsk; Alexandr I. Burdukovsky, ulitsa Schorsa, 50, kv. 32, Krasnoyarsk; Sergei V. Daibov, Kyshtym, and Alexandr S. Kurdjukov, Kyshtym, all of U.S.S.R.

PCT No. PCT/SU88/00285, § 371 Date Jan. 23, 1990, § 102(e) Date Jan. 23, 1990, PCT Pub. No. WO89/11580, PCT Pub. Date Nov. 30, 1989
PCT Filed Dec. 28, 1988, Ser. No. 455,367
Claims priority, application U.S.S.R., May 23, 1988, 4429566; Nov. 18, 1988, 4603481
Int. Cl.[5] E21B 10/40, 10/62
U.S. Cl. 175—293 9 Claims



1. A percussion-rotary drilling tool comprising a body (1) designated to interact with a percussion-rotary device and having at least one through channel (12) to pass a working medium used for removing slime from a borehole (15) and a casing (2) shaped as a sleeve with a working end and having through holes situated along concentric circles, said through holes accomodating rock-crushing elements (5,6) arranged in a manner allowing axial displacement thereof, portions of said rock-crushing elements (5,6) extending beyond said working end of the casing (2) and situated along one of the concentric circles forming a separate concentric row, said rock-crushing elements (5,6) having shanks (8,7) interacting with the body (1), said casing including a means (9) for its axial displacement with respect to the body (1) and having at least one through channel (14) to pass a working medium used for removing slime from the borehole (15), characterized in that each rock-crushing element (6) in the row being the most remote from the axis of the casing (2) comprises a means (16) for fixing it in the casing (2), and the length of axial displacement of the casing relative to the body (1) is at least equal to the length (H) of the wearable portion of the rock-crushing element (6).

5,004,057

DRILL BIT WITH IMPROVED STEERABILITY

Gordon A. Tibbitts, Salt Lake City, and Mark L. Jones, Midvale, both of Utah, assignors to Eastman Christensen Company, Salt Lake City, Utah

Continuation of Ser. No. 146,290, Jan. 20, 1988, abandoned. This application Aug. 14, 1989, Ser. No. 394,169
Int. Cl.[5] E21B 10/46
U.S. Cl. 175—408 6 Claims

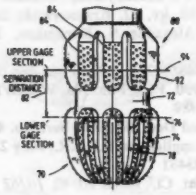
1. A drill bit having improved steerability for drilling deviated portions of boreholes in earth formations, comprising:

(a) a body member;

(b) a plurality of cutting elements on said body member adapted to penetrate said formation and form a borehole when said drill bit is rotated within said formation; and

(c) a first gage cutting section on said drill bit, said first gage cutting section having a plurality of gage cutting portions peripherally spaced on the first gage cutting section of the bit;

(d) a second gage cutting section on said drill bit, said second gage cutting section having a plurality of gage cutting portions peripherally spaced on the gage cutting section



of the bit, said gage cutting portion of said second gage cutting section being longitudinally spaced from gage cutting portions of said first gage cutting section, thereby defining a gap between longitudinally adjacent gage cutting portions of said first and second gage cutting sections, whereby at least one gage cutting portion of said first and second gage cutting sections functions as a fulcrum around which said bit may deflect, said longitudinal spacing facilitating deflection of said bit by enhancing the lateral cutting capability of said bit.

5,004,058

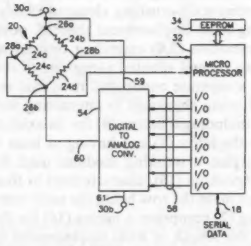
WEIGH SCALE USING MULTIPLE DIGITAL LOAD CELLS

Stephen R. Langford, Joplin; James R. Stone, and William C. Bagley, both of Webb City, all of Mo., assignors to Cardinal Scale Manufacturing Company, Webb City, Mo.

Filed Mar. 27, 1990, Ser. No. 500,024

Int. Cl.[5] G01G *3/14*; G01L *25/00, 1/22*

U.S. Cl. 177—25.13 **15 Claims**



1. A weigh scale comprising:

load receiving means for receiving a load to be weighed;

a plurality of load cells for placement in supportive relationship with said receiving means,

each of said load cells including means for receiving an excitation voltage from a source thereof and means for producing a load cell output in accordance with the load weight supported;

digital signal means for producing a plurality of digital excitation signals corresponding to and representative of selected excitation voltages for said respective load cells; and

excitation control means coupled with said load cells and with said digital signal means for receiving said digital signals and responsive thereto for controlling the respective excitation voltages of said load cells in accordance with the corresponding digital signal.

5,004,059

STRESS WAVE LOAD CELL

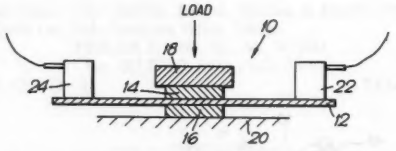
John R. Webster, Derby, England, assignor to Rolls-Royce plc, London, England

Filed Feb. 15, 1990, Ser. No. 480,661

Claims priority, application United Kingdom, Mar. 14, 1989, 8905821

Int. Cl.[5] G01G *3/14*; G01L *1/10*

U.S. Cl. 177—210 R **10 Claims**



1. A stress wave load cell comprising a propagation member which allows the propagation of stress waves therethrough, the propagation member having at least one surface,

at least one damping member arranged such that when a load is applied to the load cell a damping load is applied on the at least one surface of the propagation member by the damping member, the damping load applied by the damping member increasing with the load,

at least one transducer acoustically coupled to the propagation member, the at least one transducer being arranged to launch a stress wave signal into the propagation member,

at least one means acoustically coupled to the propagation member to detect the stress wave signal after it has propagated through the propagation member and been damped by any damping load applied by the damping member on the propagation member, the at least one means to detect the stress wave signal being arranged to convert any detected stress waves into an electrical signal,

a processor being arranged to process the electrical signal to give an electrical output signal as a measure of the load applied on the load cell.

5,004,060

TRACKED VEHICLE WITH AN EPICYCLIC STEERING DIFFERENTIAL

Rino Oreste Barbagli, and Giorgio De Castelli, both of Borgaretto, Italy, assignors to Fiatgeotech S.p.A., Modena, Italy

Filed Oct. 27, 1988, Ser. No. 263,300

Int. Cl.[5] B62D *11/18*

U.S. Cl. 180—6.44 **2 Claims**

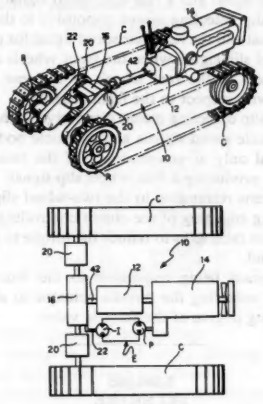
1. A tracked vehicle including an internal combustion engine, track drive wheels, an epicyclic steering differential driven by the engine and adapted to rotate the drive wheels, and a reversible auxiliary motor operatively associated with the differential for operating the steering of the vehicle, wherein:

a differential includes first and second epicyclic trains having a common central axis and each provided with a sun gear, a planet carrier and a ring gear mutually cooperating with each other;

the internal combustion engine being connected for rotation with the planet carrier of the first epicyclic train and the ring gear of the second epicyclic train respectively, the planet carrier of the first epicyclic train and the ring gear of the second epicyclic train being connected for rotation with each other about the central axis,

the auxiliary motor being connected for rotation with the sun gears of the first and second epicyclic trains respectively, the sun gears being connected for rotation with each other about the central axis,

the differential having output means connected with the ring gear of the first epicyclic train and the planet carrier of the second epicyclic train, and



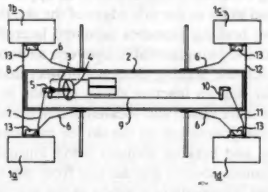
speed reduction means connected between the output means and the drive wheels.

5,004,061

ELECTRICALLY POWERED MOTOR VEHICLE

Jean-Claude Andruet, S.C. Michèle Béroud, Portigliolo, 20138 Coti Chiavari, France

Filed May 31, 1989, Ser. No. 359,143
Claims priority, application France, May 31, 1988, 88 07243
Int. Cl.[5] B60K *1/00*
U.S. Cl. 180—65.5 **13 Claims**



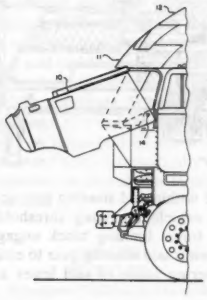
1. A motor vehicle including at least two axles and wheel assemblies, one in front and one in the rear of the motor vehicle, at least one of which is driven and at least one of which steers, the power to said vehicle being supplied by an on-board source of electrical energy, wherein each wheel of the driven axle and wheel assembly is equipped with an electric back-geared motor assembly supplied by the source of electrical energy, said motor assembly being connected to a chassis of the vehicle by two suspension elements articulated on the motor assembly on a first side and on the chassis on a second side, an output shaft of said motor assembly comprising the axle of the corresponding wheel, wherein each axle and wheel assembly includes two wheels that are symmetrical with respect to the median longitudinal plane of the vehicle, and the suspension elements are suspension triangles.

5,004,062

VEHICLE NOSE PIVOTAL HINGE ASSEMBLY

John Foot, Fremont, Calif., assignor to Paccar Inc., Bellevue, Wash.

Filed Sep. 14, 1988, Ser. No. 244,722
Int. Cl.[5] E05D *7/10*
U.S. Cl. 180—69.21 **1 Claim**



1. In a vehicle having a cab section and a frontal nose for gaining access into the cab section, the improvement comprising two hinge assemblies on opposite sides of said cab section for pivotally connecting said nose to said cab section for movement of the nose between a closed position and an opened position, each of said hinge assemblies including:

(a) a pivot bolt extending out from one side of said cab section and including two axially extending annular surfaces, one of which is closest to said cab section and a second annular surface which is larger in diameter than the first inner annular surface;

(b) a bushing block including a groove for receiving the larger of said annular surfaces, said groove, including a horizontal section having an entry, and an upwardly angled section extending from said horizontal section;

(c) a bushing plate having a groove corresponding to the bushing plate groove yet smaller so that it receives the inner, smaller annular surface of said bolt while retaining the outer larger annular section of the groove within the bushing block groove; and

(d) a fastening means including a segment configured to extend partially within said bushing block groove including a surface of complimentary shape to engage the bolt therein in order to fasten said bolt within the groove and serve as a bearing surface for said bolt.

5,004,063

STEERING SYSTEM FOR THE REAR WHEELS OF A VEHICLE

Algis Oslapas, Dearborn Heights, and Manfred Rumpel, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1988, Ser. No. 290,209
Int. Cl.[5] B62D *7/14*
U.S. Cl. 180—79.1 **11 Claims**

1. A steering system for the rear wheels of a vehicle having a longitudinal axis, comprising:

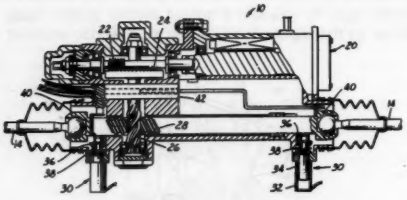
an electric motor driven, dual-range steering gear for steering said rear wheels, with said steering gear being operable within greater and lesser angular steering ranges, with each such angular steering range having a different predetermined maximum steering angle; and

control means for operating said steering gear, with said control means comprising:

means for sensing at least one vehicle operating parameter; and

means responsive to said at least one vehicle operating pa-

rameter for permitting said steering gear to extend only to the maximum steering angle of said lesser angular steering range in the event that a threshold of said at least one vehicle operating parameter has been exceeded, said means comprising at least one electromechanical travel limiting block adapted to positively engage a sliding member contained within said steering gear so that when said at least one vehicle operating threshold has been exceeded, said travel limiting block engages said sliding member to permit said steering gear to extend only to said maximum steering angle of said lesser angular steering range.



5,004,064

TRACTION CONTROL SYSTEM FOR A FOUR-WHEEL DRIVE MOTOR VEHICLE

Kazunari Tezuka, and Haruo Fujiki, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

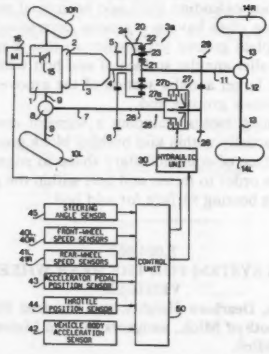
Filed Oct. 20, 1988, Ser. No. 260,802

Claims priority, application Japan, Oct. 27, 1987, 62-271003

The portion of the term of this patent subsequent to Mar. 26, 2008, has been disclaimed.

Int. Cl.[5] B60K *23/08*

U.S. Cl. 180—197 **10 Claims**



1. In a power transmitting system for a four-wheel drive vehicle having a central differential for splitting torque of an engine at a predetermined ratio, power trains for transmitting the split torques from output members of the central differential to front and rear wheels respectively of the vehicle, a throttle actuator for changing opening degree of a throttle valve of the engine, and a torque split control device including a clutch provided between the output members of the central differential for changing torque distribution ratio of the torques transmitted to the front and rear wheels, the improvement in the system comprising:

front-wheel speed sensors for detecting right and left front-wheel speeds and for producing right and left front-wheel sped signals;

rear-wheel speed sensors for detecting right and left rear-wheel speeds and for producing right and left rear-wheel speed signals;

first calculator means responsive to the right and left front-wheel and rear-wheel speed signals for producing a front-axle speed signal and a rear-axle speed signal;

two-wheel slip detecting means responsive to the front-axle speed signal and the rear-axle speed signal for producing a two-wheel slip signal when the front wheels are slipping with respect to the rear wheels or the rear wheels are slipping with respect to the front wheels;

four-wheel slip detecting means responsive to the front-axle and rear-axle speed signals and a vehicle body acceleration signal only at non-existence of the two-wheel slip signal for producing a four-wheel slip signal;

actuator means responsive to the two-wheel slip signal for controlling engaging of the clutch controlling the torque distribution ratio so as to reduce the torque to the slipping wheels; and

actuating means being responsive to the four-wheel slip signal for actuating the throttle actuator so as to reduce the opening degree of the throttle valve.

5,004,065

SKI BRAKE

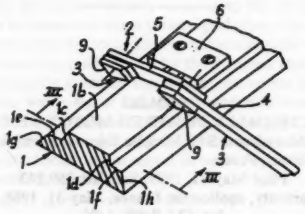
Gilles R. Goud, Annecy Cedex, France, assignor to Salomon S.A., Annecy Cedex, France

Filed May 18, 1989, Ser. No. 353,757

Claims priority, application France, May 18, 1988, 88 06651

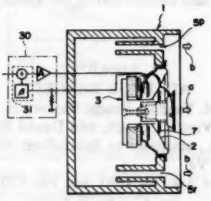
Int. Cl.[5] A63C *7/10*

U.S. Cl. 280—605 **7 Claims**



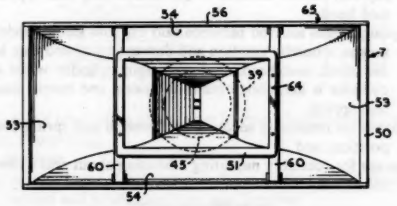
1. Ski brake to be mounted on a ski, said ski having on its upper part, a longitudinal rib defined by an upper surface and two sides being connected, respectively, to upper edges of the ski which extend as far as the side edges of the ski, the ski brake comprising two braking elements mounted laterally with respect to the ski and being movable between an active braking position in which the braking elements project under a lower plane of the ski, and an inactive skiing position in which the braking elements are raised and located above the upper edges of the ski, a pedal journalled on the ski for movement about a transverse axis, said braking element being journalled on the pedal for movement about a journal axis from the active braking position past intermediate position to the inactive position when a ski boot is inserted, an elastic mechanism for biasing the pedal and the braking elements towards the active braking position, and retraction means for moving each said braking element towards the interior of the ski during the last portion of the pivoting path of the brake between the intermediate position and the inactive position, said retraction means of each braking element comprising a support ramp and an activation member mounted on the pedal for cooperating with said support ramp when the pedal approaches the ski, said support ramp being formed by a surface of the rib, said activation member being connected to the braking element so as to pivot the braking element, about its respective axis, in the direction of the interior of ski, said pedal overlying the upper surface of the rib when the brake elements are in the inactive position.

5,004,066
ACOUSTIC APPARATUS
Kazunari Furukawa, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan
Filed Mar. 30, 1989, Ser. No. 330,470
Claims priority, application Japan, Apr. 4, 1988, 63-81343
Int. Cl.[5] H04R 7/00
U.S. Cl. 181—160 7 Claims



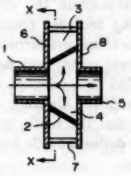
1. An acoustic apparatus, comprising:
a cabinet having an internal cavity defining a Helmholtz resonator having an open port therein;
a vibrator arranged in said Helmholtz resonator, said vibrator having one surface which drives said Helmholtz resonator and having another surface which directly radiates an acoustic wave, wherein said open port is arranged coaxially with said vibrator; and
a vibrator driver for driving said vibrator to cancel air counteraction from said resonator when said resonator is driven.

5,004,067
CINEMA SOUND SYSTEM FOR UNPERFORATED SCREENS
Eugene T. Patronis, 1774 Northridge Rd., Dunwoody, Ga. 30350
Filed Jun. 30, 1988, Ser. No. 213,522
Int. Cl.[5] G10K 11/10
U.S. Cl. 181—188 9 Claims



1. A speaker arrangement comprising:
(a) a middle frequency horn defined by wall means providing a throat portion, a mouth portion spaced forwardly of said throat portion and a projection axis extending forwardly from said throat portion through said mouth portion, said middle frequency horn being configured to have a principal frequency response in a relatively middle frequency range of a hearing spectrum of a human;
(b) a middle frequency driver acoustically coupled to said middle frequency horn along said projection axis;
(c) a high frequency horn mounted coaxially within said middle frequency horn in front of said middle frequency driver, said high frequency horn defined by wall means providing a throat portion and a mouth portion, and being configured to have a principal frequency response in a relatively high frequency range of said human hearing spectrum;
(d) a high frequency driver acoustically coupled to said high frequency horn along said projection axis;
(e) said high frequency horn wall means including opposite upper and lower walls and opposite side walls, said side walls being spaced apart farther than said upper and lower walls such that said high frequency horn has a high frequency dispersion pattern which is more lateral with respect to said projection axis than elevational; and
(f) said middle frequency horn wall means including opposite upper and lower walls and opposite side walls, said side walls being spaced apart farther than said upper and lower walls, said wall means being contoured such that at a lower end of said middle frequency range with said high frequency horn mounted therein said middle frequency horn and driver cooperate to behave acoustically as a direct radiator and at a middle and a higher end of said middle frequency range said middle frequency horn and driver cooperate to behave acoustically as a sectoral horn having a dispersion pattern similar to said high frequency dispersion pattern.

5,004,068
MUFFLER
Toshitsugu Sase, Kanagawa; Michiaki Matsuda, Tokyo; Kiyoshi Yanagisawa, and Mitsuru Maeda, both of Kanagawa, all of Japan, assignors to Ebara Corporation, Tokyo, Japan
Filed Dec. 6, 1989, Ser. No. 446,766
Claims priority, application Japan, Dec. 6, 1988, 63-306950
Int. Cl.[5] F01N 1/02
U.S. Cl. 181—276 4 Claims



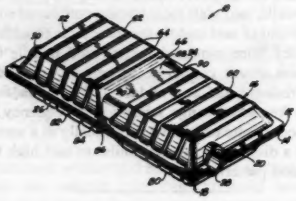
1. A muffler comprising:
a barrel having first and second side plates mounted to opposing ends thereof to form a substantially enclosed cavity;
an inlet tube attached to said first side plate and communicating with said substantially enclosed cavity;
an outlet tube attached to said second side plate and communicating with said substantially enclosed cavity;
a perforated tube mounted within said substantially enclosed cavity and having a first end connected to said first side plate in direct fluid communication with said inlet tube and a second end connected to said second side plate in direct fluid communication with said outlet tube, said perforated tube having substantially a funnel shape, one of said first and second ends of said perforated tube having an inside diameter which is greater than or equal to an inside diameter of said inlet tube and greater than or equal to an inside diameter of said outlet tube, another of said first and second ends of said perforated tube having an inside diameter which is greater than said inside diameter of said inlet tube, greater than said inside diameter of said outlet tube and greater than said inside diameter of said one of said first and second ends of said perforated tube, said perforated tube dividing said substantially enclosed cavity into an inner resonance cavity which is substantially void of sound absorbing material and an outer resonance cavity which is substantially void of sound absorbing material.

5,004,069

STAMP FORMED MUFFLER WITH TRANSVERSE BAFFLE TUBE

Bennie A. Van Blaircum, Whitehouse; Jon W. Harwood, Toledo, and Mark S. Kimmet, Ottoville, all of Ohio, assignors to AP Parts Manufacturing Company, Toledo, Ohio

Filed Jan. 26, 1990, Ser. No. 471,288
Int. Cl.[5] F01N *1/02, 7/18*
U.S. Cl. 181—282 17 Claims



1. A stamp formed muffler comprising:

first and second plates secured in face-to-face relationship, said plates being stamp formed to define an array of tubes therebetween, said tubes comprising an inlet to the muffler and an outlet from the muffler, selected portions of said tube intermediate said inlet and said outlet including communication means formed through at least one of said plates for permitting communication of exhaust gases from said tubes; and

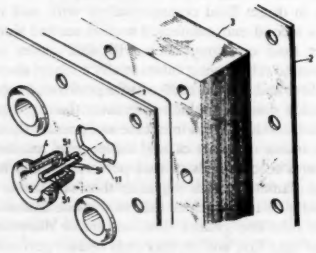
an external shell formed to define a plurality of chambers therein, an elongated baffle crease being formed in said external shell intermediate the chambers thereof, said external shell being securely connected to one of said plates such that the chambers surround selected communication means in said plate, said baffle crease extending substantially parallel to a selected one of said tubes and being disposed in direct abutting contact with said selected tube such that the baffle crease and the tube in contact therewith define a baffle for separating the chambers of the muffler.

5,004,070

ACOUSTIC BOARD

Hong-Jen Wang, 14-3, Fu-Hsing I Road, Kao-Hsiung City, Taiwan

Filed Aug. 16, 1990, Ser. No. 568,029
Int. Cl.[5] E04B *1/82*
U.S. Cl. 181—286 2 Claims



1. An acoustic board comprising:

a framework;

a front panel formed with a plurality of openings and fitted on one side of said framework;

a rear panel fitted on another side of said framework thereby forming a space between said front panel and said rear panel;

a plurality of sound collecting cylinders having an open front end and a closed second end, each fitted within respective openings of said front panel and having said open end aligned with said openings of the front panel; and

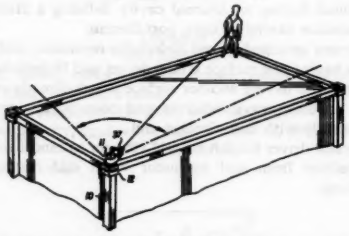
a plurality of silencers formed with a plurality of perforations and extended through and supported in an opening provided in said second end of the sound collecting cylinder.

5,004,071

ADAPTOR BRACKET

Bobby J. Mallard, Virginia Beach; Richard H. Knapp, Norfolk; W. J. Roper, Virginia Beach, and Daniel R. Harrison, Norfolk, all of Va., assignors to Specialized Shipping Products, Ltd., Norfolk, Va.

Filed Apr. 13, 1990, Ser. No. 520,652
Int. Cl.[5] A62B *35/00*
U.S. Cl. 182—3 17 Claims



1. An adaptor bracket for rotatably securing a retractable lifeline block to a corner casting mounted on a frame, said adaptor bracket comprising

cylindrical means;

a shaft rotatably mounted and axially movable within said cylinder means, said shaft terminating in a substantially rectangular head extending outwardly from said cylindrical means;

a cap and handle secured to the end of said shaft opposite said head;

spring means secured between said cap and said cylindrical means, whereby rotation and depression of said cap, handle, shaft, and head relative to said cylinder while said cylinder is immobile creates a tension and torque bias in said spring;

means for releasably securing said head in said spring-biased position; and

means for rotatably mounting a housing about said cylindrical means.

5,004,072

WORK PLATFORM APPARATUS FOR ROOFS

Russell C. Launer, 9051 W. Temple Pl., Littleton, Colo. 80123

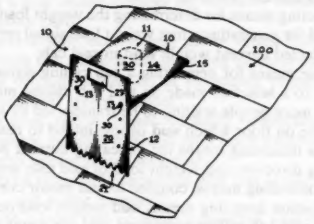
Filed Jan. 19, 1990, Ser. No. 467,440
Int. Cl.[5] E04G *5/08, 3/12*
U.S. Cl. 182—45 1 Claim

1. An adjustable support apparatus for pitched roofs having varying pitch angles wherein the apparatus consists of:

a horizontal support unit including a generally elongated flat rectangular platform member having a pair of spaced recesses formed on one edge; and a tapered surface on the opposite edge;

a vertical support unit including a generally elongated flat rectangular panel member having a plurality of spaced and vertically aligned pairs of apertures; wherein the panel member has an upper end and a lower end; and, the lower end is provided with a toothed gripping surface;

wherein the panel member is further provided with a handle opening formed proximate to but spaced from said upper end; and, fastening means dimensioned to be releasably received in said recesses and through a selected one of said plurality of pairs of apertures for operatively connecting the horizontal support unit to the vertical support unit at a 90° angle.

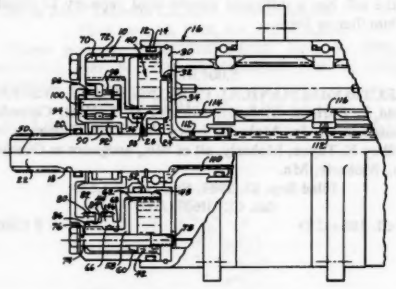


5,004,073

AUTOMATIC LUBRICATION DEVICE FOR MECHANICAL ACTUATION SYSTEMS

Duane H. Grimm, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 22, 1989, Ser. No. 440,074
Int. Cl.[5] F01M *9/10*
U.S. Cl. 184—6.12 **11 Claims**



1. A self lubrication mechanism having a bidirectional rotary input comprising;

a housing;

a rotary input shaft journaled for bidirectional rotation within and extending from said housing;

a one-way clutch within said housing and coupled to said shaft, said clutch having an output element that is rotated by said shaft for one direction of rotation of said shaft and which may remain stationary for the opposite direction of rotation of said shaft;

a pair of coupled planetary gears in said housing and rotatable in response to rotation of said clutch output;

a fixed ring gear meshed with one of said planet gears;

a rotatable ring gear meshed with the other of said planet gears and rotatable in response to rotation of said planet gears;

a variable volume, lubricant reservoir with in said housing and having an outlet from which lubricant may exit to be directed to a component to be lubricated; and

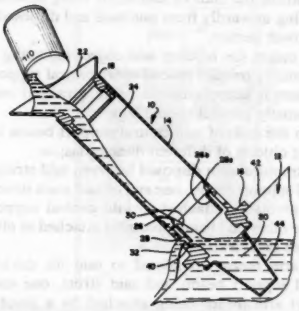
means responsive to rotation of said rotatable ring gear for progressively decreasing the volume of said reservoir to thereby direct lubricant through said outlet.

5,004,074

OVERFILL FILLER PIPE ASSEMBLY

Gordon Jewess, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 3, 1990, Ser. No. 460,305
Int. Cl.[5] F16N *21/00*
U.S. Cl. 184—105.1 **20 Claims**



1. A filler pipe assembly for a liquid containing reservoir, comprising:

an elongated filler pipe having one end integral with said liquid containing reservoir and the other end remote from said liquid containing reservoir, said elongated filler pipe having a liquid-supplying opening at the end thereof integral with said liquid containing reservoir and a liquid-receiving opening at the end thereof remote from said liquid containing reservoir together with a liquid passageway extending therebetween, said elongated filler pipe being adapted to receive liquid in said liquid-receiving opening and direct liquid into said liquid containing reservoir;

said elongated filler pipe having a liquid overfill opening at a point remote from said liquid-receiving opening; and

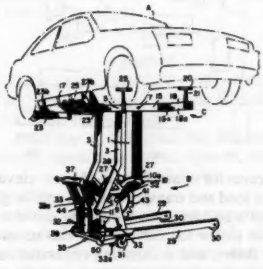
means forming a one-way barrier relative to said liquid overfill opening for directing liquid introduced at said liquid-receiving opening past said liquid overfill opening and into said liquid containing reservoir while allowing liquid in said liquid containing reservoir to escape through said liquid overfill opening in the event of introduction of liquid in a quantity sufficient to reach said liquid overfill opening in an overfill condition.

5,004,075

LIFTING DEVICE FOR OBJECTS

Anthony Ascenzo, 70 Commercial St., Boston, Mass. 02109

Filed Aug. 30, 1989, Ser. No. 400,505
Int. Cl.[5] B60S *13/00*
U.S. Cl. 187—8.41 **20 Claims**



14. A lift device for elevating an object entirely from a

surface, said device being adapted to approach the object to be lifted perpendicularly to its longitudinal axis, said device comprising:

a base including means for movably supporting said lift device on a surface, said base comprising a power section and a floor stand, said floor stand being substantially horizontally disposed and comprising legs extending therefrom, said power section including a pair of spaced-apart struts, the ends of said struts being attached to and extending upwardly from said base and disposed adjacent said power section;

carriage means for holding said object including a pair of substantially parallel spaced-apart central support beams, said central support beams being arranged on a plane substantially parallel to said legs;

means on the ends of said central support beams to accommodate objects of different dimensions;

a main structural arm disposed between said struts and said central support beams, one end of said main structural arm being pivotably attached to said central support beams and the other end being pivotably attached at pivot points between said struts;

support arm means connected to said lift device at said central support beams and said struts, one end of said support arm means being attached by a pivot distantly from the attachment of said main structural arm to said central support beam, the other end of said support arm being attached by another pivot to said brace means at a point distantly located from the pivots, whereby rotation of said carriage around the pivot between said central support beams and the main structural arm is limited and said carriage can be maintained on a horizontal plane;

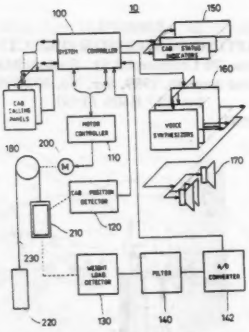
means to lift said carriage, said means connecting said power section and main structural arm, opposite ends of said lift means being pivotably attached to said main structural arm and to said power section.

5,004,076

APPARATUS FOR CONTROLLING AN ELECTRIC ELEVATOR

Hai C. Chen, 4F, No. 85, Chiang nan St., Nei hu, Taipei, and Felix W. H. Yeh, No. 392, Yen pin St., Chia yi City, both of Taiwan

Filed Apr. 18, 1989, Ser. No. 339,981
Int. Cl.[5] B66B *3/00*
U.S. Cl. 187—130 **10 Claims**



1. An apparatus for controlling an electric elevator having a cab adapted to load and transport people and/or goods to each of the floors of a building into which the elevator is mounted, and an electric motor for driving said cab to ascend and descend to said floors, said controlling apparatus comprising:

a motor controller for controlling the rotation of said driving motor of said elevator and therefore controlling the transfer of said cab from one floor of said building to another;

position detecting means for determining current position of said cab and for generating a cab position signal representing said current position;

load detecting means for determining the weight load of said cab and for generating a first weight load signal representing detected current weight load in said cab;

cab calling means for generating a cab calling signal in response to a selection made on said cab calling means by one or more people waiting to be transported by said cab to arrive on floor which said people intend to reach;

cab status indicating means for indicating current position, running direction and weight load of said cab; and

system controlling means, coupled to said motor controller, said position detecting means, said weight load detecting means, said cab calling means and said cab status indicating means, for receiving said cab position signal from said position detecting means, said first weight load signal from said weight load detecting means, and said cab calling signal from said cab calling means, for generating in accordance with said first weight load signal one of a plurality of second weight load signals including at least one full-load signal, for actuating said cab status indicating means to indicate current position, running direction and weight load of said cab in accordance with said cab position signal and said one second weight load signal, and for enabling said motor controller to actuate the driving motor of the electric elevator in accordance with said cab calling signal;

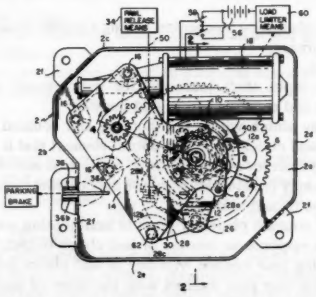
whereby current condition of weight load in said cab may be presented to a person or people waiting for said cab who then may know in advance in accordance with the indication of said cab condition indicating means whether or not the cab has a sufficient weight load capacity to transfer him/her or them.

5,004,077

ELECTROMECHANICAL PARKING BRAKE SYSTEM

Harold L. Carlson, Moberly; Michael D. DeWitt, Columbia; Louis Martel, Jr., Moberly; Larry W. Kelley, Salisbury, and Jeffrey E. Tayon, Moberly, all of Mo., assignors to Orscheln Co., Moberly, Mo.

Filed Sep. 13, 1989, Ser. No. 406,549
Int. Cl.[5] B60T *1/00*
U.S. Cl. 188—2 D **8 Claims**



1. Parking brake apparatus for operating the parking brake cable of a vehicle between non-tensioned brake-released and tensioned brake-engaged condition, respectively, comprising:

(a) a housing (2) provided with a stationary main pivot shaft (4);

(b) an annular cable track member (10) journalled on said pivot shaft, said cable track member being adapted for connection with one end of the parking brake cable;

(c) drive means for alternately rotating said cable track member in opposite directions on said pivot shaft toward brake-engaged and brake-released positions relative to said housing, respectively, said drive means including:

(1) a gear sector member (6) rotatably mounted on said pivot shaft;

(2) reversible electric gear motor means (18) connected with said housing and including an output shaft having a driving pinion (20) in enmeshing engagement with said gear sector member;

(3) pawl ratchet means normally connecting said gear sector member with said cable track member, said pawl and ratchet means including:

(a) a ratchet (8) connected with one of said cable track and sector members;

(b) a pawl (28) pivotally connected with the other of said members; and

(c) spring means (30) normally biasing said pawl toward engagement with said ratchet; and

(4) means (58) for alternately operating said motor means in opposite directions, respectively; and

(d) means (34,62) for releasing said pawl from said ratchet, thereby to disconnect said cable track member from said drive means.

5,004,078

VENTILATED DISK AND PROCESS FOR MAKING SAME

Toshio Oono, and Hiroki Uemura, both of Aichi, Japan, assignors to Aisin Takaoka Co., Ltd., Toyota, Japan

Filed Oct. 18, 1989, Ser. No. 422,896

Claims priority, application Japan, Nov. 9, 1988, 63-146219[U]; Nov. 9, 1988, 63-146220[U]; Nov. 9, 1988, 63-146221[U]

Int. Cl.[5] F16D 65/12; F16F 15/14

U.S. Cl. 188—218 A 16 Claims

1. A ventilated disk comprising:

a pair of mutually opposing disk portions;

a plurality of substantially radially extending ribs formed integral with said disk portions and interposed therebetween;

a plurality of said ribs being formed to have at least one radially extending oblong hole penetrating the rib in a circumferential direction, said oblong holes defining at least one circular array along a circle whose center is the center of said disk portions; and

at least one annular damping member extending throughout said oblong holes defining the said at least one circular array, said annular damping member being in intimate engagement with an outer end portion and side portions of each of said oblong holes.

5,004,079

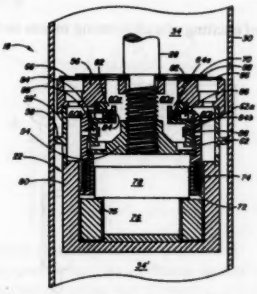
SEMI-ACTIVE DAMPER VALVE MEANS AND METHOD

Douglas E. Ivers, Cary, and Charles M. Nobles, Fuquay-Varina, both of N.C., assignors to Lord Corporation, Erie, Pa.

Filed Feb. 10, 1989, Ser. No. 310,144

Int. Cl.[5] F16F 9/50, 9/46

U.S. Cl. 188—282 24 Claims



1. Semi-active damper means, comprising:

a hydraulic damper assembly switchable between high and low damping states wherein the damping coefficient of said damper assembly is respectively relatively high and relatively low, said damper assembly having relatively movable members defining a pair of interconnected chambers containing hydraulic fluid, relative movement in compression and extension of said movable members creating a fluid pressure differential and causing flow of said fluid between said chambers;

valve means for regulating said flow of fluid between said interconnected chambers, said valve means being operable between first and second conditions, wherein in said first condition said fluid flow is restricted to a relatively greater extent such that said damping coefficient of said damper assembly is relatively high, and wherein in said second condition said fluid flow is restricted to a relatively lesser extent such that said damping coefficient of said damper assembly is relatively low;

valve drive means movable between first and second positions for when actuated imparting forces to said valve means tending to cause transition thereof between said first and second conditions, said valve means also being subject to biasing forces by said fluid pressure differential such that transition from said first condition to said second condition is automatically deferred until said biasing forces are at a preselected low magnitude;

relative velocity switching means for automatically switching said damper assembly from one to the other of said damping states, without transition of said valve drive means from one to the other of said first and second positions, upon transition of said damper assembly between compression and extension and extension and compression of said movable members.

5,004,080

CONTROLLING CIRCUIT FOR ACTUATOR

Shunichi Wada, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 9, 1990, Ser. No. 506,419

Claims priority, application Japan, Apr. 21, 1989, 1-102717

Int. Cl.[5] F16F 9/46

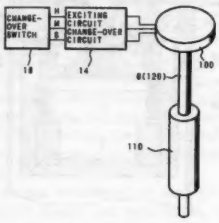
U.S. Cl. 188—299 10 Claims

1. A controlling circuit for an actuator which is provided with a rotating shaft to be stopped in each of a plurality of rotational positions, a rotor which is connected to said rotating shaft and in which the even number of magnetic poles of permanent magnet are arranged with equal interval, and a stator

which is arranged to be positioned around said rotor and in which electro-magnets whose number is one and half times of the number of magnet poles of said permanent magnet are arranged with equal interval, comprising:

a change-over switch having a plurality of switching elements each of which corresponds to each of rotational position for designating each of rotational positions of said rotating shaft by selecting each of said switching element; and

a plurality of exciting circuit forming means each of which is



connected to each said switching element, respectively, and which forms an exciting circuit so that said plurality of electro-magnets is selectively magnetized in order to rotate said rotating shaft to be in a designated rotational position by connecting each of switching elements to a power source,

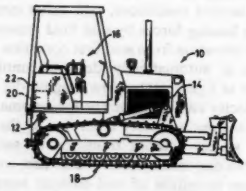
wherein said each exciting circuit forming means comprises electrifying switching means for forming said exciting circuit for a predetermined duration from the time when switching elements to which each of themselves is connected have been connected to a power source.

5,004,081

BATTERY RESTRAINT SYSTEM

Bruce C. Custer, Metamora, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Dec. 20, 1989, Ser. No. 453,747
Int. Cl.[5] B60R *16/04*
U.S. Cl. 180—68.5 **13 Claims**



1. A battery restraint system for securing a battery to a frame structure, comprising:

first and second spaced apart strap assemblies, each including a flexible non-metallic strap having a first end portion and a second end portion, a bracket secured to each of said first end portions, and said second end portion defining a loop;

a tensioning bar having first and second end portions and a center portion, said first and second end portions being adapted to engage respectively said first and second loops;

first means for securing said brackets to said frame structure;

second means for securing said center portion of said tensioning bar to said frame structure; and

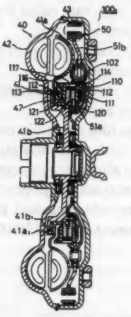
tensioning means for applying a substantially constant downward force on said tensioning bar and said first and second strap assemblies.

5,004,082

STARTING DEVICE OF AN AUTOMATIC TRANSMISSION FOR VEHICLE

Shiro Sakakibara, Toyokawa, and Takashi Furuya, Chiryu, both of Japan, assignors to Aisin AW Co., Ltd., Anjo, Japan

Filed Dec. 30, 1988, Ser. No. 292,240
Claims priority, application Japan, Mar. 23, 1988, 63-70158
Int. Cl.[5] F16H *45/02*
U.S. Cl. 192—3.26 **14 Claims**



1. A starting device for an automatic transmission of a vehicle having an engine, the transmission having an input shaft and the engine having an output shaft, comprising:

a hydraulic coupling disposed between said output shaft of said engine and said input shaft of said automatic transmission, said hydraulic coupling having an input side and an output side, said output side of said hydraulic coupling comprising a turbine runner and a hub which are rotatable relative to each other;

a lock-up clutch connecting said output shaft of said engine and said output side of said hydraulic coupling, said output side of said hydraulic coupling being connected to said input shaft of said automatic transmission;

a slip clutch connected in series with said lock-up clutch, said slip clutch being disposed between said output shaft of said engine and said output side of said hydraulic coupling, said slip clutch including a plurality of friction plates and biasing means for applying a predetermined biasing force to said plurality of friction plates to urge said friction plates together; and

cam means, disposed in a power transmission path at said output side of said hydraulic coupling, for generating an axial force proportional to a torque transmitted between said power transmission path and for applying said axial force to said plurality of friction plates of said slip clutch so that said slip clutch has a torque capacity proportional to said applied torque, said cam means comprising an operating-side cam and an operated-side cam which are rotatable relative to each other, said operating-side cam being connected to said turbine runner and said operated side cam being connected to said hub.

5,004,083

COUPLING FOR A BICYCLE

Oskar R. Lohman, Smedevaegen 16, S-131 33 Nacka, Sweden

PCT No. PCT/SE88/00191, § 371 Date Nov. 29, 1989, § 102(e) Date Nov. 29, 1989, PCT Pub. No. WO88/07955, PCT Pub. Date Oct. 20, 1988
PCT Filed Apr. 13, 1988, Ser. No. 424,227
Claims priority, application Sweden, Apr. 13, 1987, 8701526-9
Int. Cl.[5] F16D *41/24, 67/00*
U.S. Cl. 192—5 **14 Claims**

1. Coupling means for a bicycle having a drive wheel, a drive wheel hub, and a pedal crank assembly which operates a

drive transmission and a brake activating means, said coupling means comprising:

a first freewheel coupling associated with the pedal crank assembly for torque transfer to the brake activating means at reverse rotation of the pedal crank;

a second freewheel coupling associated with the drive wheel hub of the bicycle for torque transfer to the drive wheel upon forward rotation of the pedal crank assembly;

a third freewheel coupling associated with the drive transmission and adapted to be activated upon a reverse rotation of the drive wheel; and

shifting means associated with said third freewheel coupling for preventing engagement of said second freewheel coupling when said third freewheel coupling is activated.

5,004,084

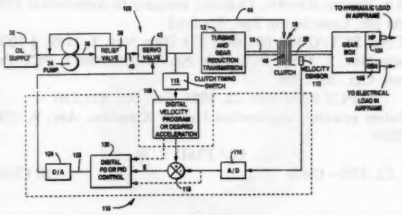
CLOSED LOOP CONTROL OF A HYDRAULICALLY CONTROLLED CLUTCH

Kourosh Mehr-Ayin, Vista, and Paul A. Schuh, San Diego, both of Calif., assignors to Sundstrand Corporation, Rockford, Ill.

Filed May 24, 1989, Ser. No. 356,273

Int. Cl.[5] F16D *43/284*

U.S. Cl. 192—0.033 **37 Claims**



1. A control system for a hydraulically controlled clutch for coupling a source of rotary power to a load for accelerating the load from a first velocity to a second velocity within a time measured from a beginning of the acceleration and ending between first and second times measured from the beginning of acceleration with the load being variable during the acceleration of the load from the first velocity to the second velocity comprising:

a source of pressurized hydraulic fluid;

a servo valve, having an inlet coupled to the source of pressurized fluid and an outlet coupled to the hydraulically controlled clutch, the servo valve being responsive to a control signal to vary the pressure of hydraulic fluid applied to the hydraulically controlled clutch to vary the coupling between the source of rotary power and an output shaft which is coupled to the load;

a sensor for producing a velocity signal proportional to the velocity of the output shaft;

a stored program controlling a programmed acceleration of the load from the first velocity to the second velocity within a time interval measured from the beginning of the acceleration and ending between the first and second times; and

a controller, responsive to the stored program and the velocity signal, for producing the control signal which is a function of a difference between the velocity signal and a desired velocity of the output shaft during acceleration from the first velocity to the second velocity produced by the stored program.

5,004,085

FLUID FRICTION COUPLING WITH CLOSING SLIDE

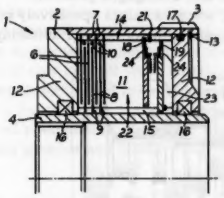
Herbert Taureg, Hennef, Fed. Rep. of Germany, assignor to Viscodrive GmbH, Lohmar, Fed. Rep. of Germany

Filed Mar. 7, 1990, Ser. No. 490,146

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1989, 3908090

Int. Cl.[5] F16D *31/00, 43/24*

U.S. Cl. 192—58 B **6 Claims**



1. A fluid friction coupling, comprising:

a first coupling part formed as a housing having an interior;

at least one second coupling part formed as a hub rotatably received within the first coupling part;

a set of plates associated with each coupling part, each set of plates being non-rotatingly connected to its associated coupling part, the plates associated with the first coupling part being interleaved with those associated with the second coupling part in a main chamber defined in the interior of the first coupling part;

a viscous medium at least partially filling a portion of the interior of the first coupling part which is not occupied by the plates, the interior of the first coupling part also defining an additional receiving chamber for the viscous medium;

at least one separating plate associated with one of the coupling parts and provided with at least one aperture so as to separate the receiving chamber from the main chamber;

a cover for said aperture mounted on said separating plate so as to be movable between a first position in which it closes the aperture and a second position in which the aperture is opened; and

spring means for biasing the cover to its first position, the cover being arranged to move to its second position under centrifugal force against the action of said spring means when a predetermined rotational speed of the separating plate is exceeded.

5,004,086

CLUTCH ASSEMBLY FOR A MOTOR VEHICLE

Rainer Petzold; Walter Fritz, both of Friedrichshafen, and Norbert Wiencek, Hagnau, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/EP88/00545, § 371 Date Dec. 19, 1989, § 102(e) Date Dec. 19, 1989, PCT Pub. No. WO88/10376, PCT Pub. Date Dec. 29, 1988

PCT Filed Jun. 21, 1988, Ser. No. 445,616

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1987, 3721318

Int. Cl.[5] F16D *25/14*

U.S. Cl. 192—85 C **13 Claims**

1. A drive train for a motor vehicle, comprising:

a gearbox formed with an input shaft rotatable about an axis of rotation;

an engine spaced from said gearbox and formed with an engine shaft coaxial with said input shaft;

a clutch arranged in a torque transmission path between said engine and input shafts spaced from said gearbox and having an engaged position and a disengaged position; said clutch being provided with a clutch housing and with

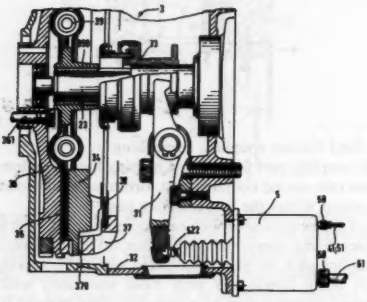
release means for releasing said engaging position of said clutch;

an actuating unit mounted on said clutch and including:

an actuating unit directly connected with said clutch housing,

a piston and cylinder unit including a cylinder formed in said actuating housing and a piston movable back and forth in said cylinder parallel to said axis of rotation and connected with said releasing means for displacing said clutch into said disengaged position,

a plurality of solenoid values operatively connected with said piston and cylinder unit for actuating said piston,



a single pressure supply connection mounted on said actuating housing for interconnecting said piston and cylinder unit and said valves with an external pressure supply source,

a travel measuring device operatively connected with said solenoid valves mounted in said housing for controlling said engaged and disengaged positions of the clutch, and

a single plug junction mounted on said actuating housing for connection to said measuring device said solenoid valves for selective operation thereof.

5,004,087

FRICTION CLUTCH

Lothar Huber, Altschweier, Fed. Rep. of Germany, assignor to Luk Lamellen Und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

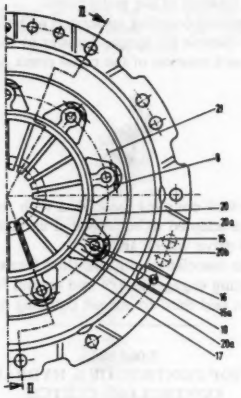
Filed Jul. 21, 1989, Ser. No. 384,129

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1988, 3825197

Int. Cl.[5] F16D *13/50*

U.S. Cl. 192—89 B **9 Claims**

1. A friction clutch, particularly for use in motor vehicles, comprising a cover having a first side and a second side; an axially movable pressure plate adjacent the first side of said cover; at least one diaphragm spring including means for biasing said pressure plate; a first seat between said cover and said spring; a second seat, said spring being disposed between said seats; and means for connecting said second seat and said spring to said cover, including a plurality of beams and elongated torsion bars integral with said cover and with said beams, each of said beams including a free end and a second end which is integral with one of said torsion bars and each of said torsion bars including a median portion integral with the second end of the respective beam and two outer portions flanking the median portion, said beams being elastically stressed in the axial direction of said pressure plate and the magnitude of stress upon each beam being dependent upon the



cross-sectional area and the length of the respective torsion bar.

5,004,088

TORSIONAL VIBRATION DAMPER

John S. Bolton, Knowle, England, assignor to Automotive Products plc, Leamington Spa, England

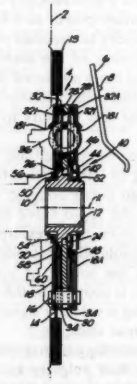
PCT No. PCT/GB88/00109, § 371 Date Nov. 1, 1989, § 102(e) Date Nov. 1, 1989, PCT Pub. No. WO88/08092, PCT Pub. Date Oct. 20, 1988

PCT Filed Feb. 22, 1988, Ser. No. 411,510

Claims priority, application United Kingdom, Apr. 9, 1987, 8708536

Int. Cl.[5] F16D *3/14*

U.S. Cl. 192—106.2 **10 Claims**



1. A rotary coupling device comprising a hub having an annular flange mounted thereon, a coaxial annular driven plate mounted on the hub for limited rotational movement relative to the hub flange, a coaxial annular floating plate also mounted on the hub for limited rotational movement relative to both the hub flange and the driven plate, and at least two sets of spring means each housed in a respective set of aligned spring windows each spring window having two opposed circumferential

ends formed by respective window edges in the hub flange, the driven plate and the floating plate and which resist the relative rotational movement therebetween so that said spring means determines an "at-rest" state when the driven plate is subject to no external torsional loads, wherein in each of said two sets of spring windows the hub flange window, the driven plate window and the floating plate windows are of different circumferential lengths and are arranged so that in the "at rest" state, for a first set of spring windows all the window edges at one circumferential end of the respective windows in said first set are in circumferential alignment, and for the second set of spring windows all the window edges of the respective windows in said second set are in alignment at the the other of said two opposed circumferential ends to said first set of windows, so that during an initial phase of rotational movement of the driven plate relative to the hub flange the two spring means act in series and in a later phase of said rotational movement the two spring means act in parallel.

5,004,089

CLUTCH DRIVEN PLATES AND METHOD OF PRODUCING THE SAME

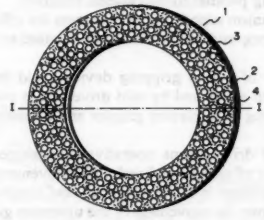
Yasuhiro Hara, Shimodate; Mitsuhiro Inoue, Oyama; Hideo Baba, Shimodate; Tadashi Okazaki, Oomiya, and Shigeru Kudo, Katsuta, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Nov. 2, 1989, Ser. No. 430,248

Claims priority, application Japan, Nov. 22, 1988, 63-295738; Jan. 20, 1989, 63-12075; Jan. 20, 1989, 63-12076; Jul. 26, 1989, 63-193392; Jul. 26, 1989, 63-193393

Int. Cl.[5] F16D *69/02*

U.S. Cl. 192—107 M **3 Claims**



1. A clutch drive plate comprising a clutch facing plate molded from a clutch facing material comprising a fiber, a binder and a friction modifier and a back-up plate carrying the clutch facing plate, wherein a number of dimples are formed on the surface of the clutch facing plate and the total area of the openings in the dimples is equal to or smaller than the area of the surface of the clutch driven plate exclusive of the openings of the dimples, the volume percentage of the total volume of the dimples in the clutch facing plate is not less than 20% of the volume of a clutch facing plate without dimple, and each dimple is so distributed as to be spaced equally in the circumferential direction on the surface of the clutch facing plate.

5,004,090

ROTATION DEVICE WITH A SEALING PLATE

Motoaki Kuribara, Gumma, and Ikuo Fujino, Ashikaga, both of Japan, assignors to Mitsuba Electric Mfg. Co., Ltd., Gumma, Japan

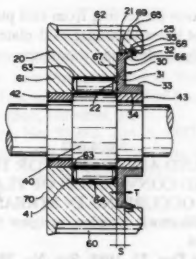
Filed Nov. 18, 1987, Ser. No. 122,155

Claims priority, application Japan, Nov. 19, 1986, 61-275557

Int. Cl.[5] F16D *41/06*; F16J *15/34*; F16C *33/76*

U.S. Cl. 192—112 **7 Claims**

1. A sealing arrangement for disposing between first and second parts of a mechanism, the first and second parts being adapted to rotate relative to each other, the rotating device including: a substantially cylindrical inner member adapted to be connected to the first part of the mechanism; a substantially hollow cylindrical outer member coaxially and rotatably disposed on the inner member and adapted to be connected to the second part of the mechanism, the outer member having front and rear end portions, the front end portion substantially fitting around the inner member, the rear end portion being spaced from the inner member so that an inner space receiving a lubricating agent is defined by the inner member and an inner face of the rear end portion, the inner space opening to a rear end face of the outer member; and an annular extension extending rearward away from an outer periphery of the rear end face of the outer member, the annular extension having an annular groove circumferentially formed therein, said annular groove having an opening facing radially inward, the groove having front and rear internal walls defining the groove, the front wall being located closer to the rear end face of the outer member than is the rear wall; the sealing arrangement including a substantially annular sealing plate, which rotatably fits around the inner member and fixedly fits in the annular extension, for closing the opening of the inner space and for aligning the axes of the outer and inner members with each other, the sealing plate comprising:



an annular plate body having one and the other faces and covering the opening of the inner space with the one face thereof in contact with the rear end face of the outer member;

an annular peripheral wall extending rearward away from an outer periphery of the other face of the plate body; and

an annular ridge extending from the peripheral wall and protruding into the groove of the annular extension so that the annular ridge is engaged with at least the rear wall of the groove of the annular extension and so that the one face of the plate body is attached to the rear end face of the outer member so as to hermetically seal the inner space, the rear end face of the outer member and the front wall of the groove defining a distance therebetween which is at least equal to a thickness of the plate body of the sealing plate.

5,004,091

COMPRESSION-MOLDED CARRYING CASE

Bradford J. Natho, Taunton; George L. Andrade, South Dartmouth; John M. Wheaton, North Dartmouth, all of Mass., and Wayne I. Schmitt, Coventry, R.I., assignors to American Tourister, Inc., Warren, R.I.

Filed Apr. 16, 1990, Ser. No. 509,208

Int. Cl.[5] A45C *3/00, 13/00*

U.S. Cl. 190—18 R **2 Claims**

1. A carrying case comprising,

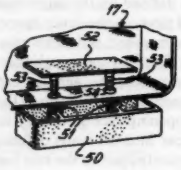
two dish-shaped shells having four sides, said shells being formed of a compression-molded fabric-foam-fabric laminate,

each said shell having a rectangular major wall and a perpendicular wall extending around the perimeter of said major wall,

means hinging said shells together along one side of each of said rectangular shells,

cooperating zippers stitched to the remaining three opposed edges of said shells,

a plurality of bumper feet mounted on an exterior side of said shell, each bumper foot having two holes opening onto said shell,



a plate mounted on the interior of said shell opposite each foot,

two serrated posts projecting from said plate and projecting into said foot holes to secure said plate to said foot with said shell side sandwiched therebetween.

5,004,092

PROCESS AND APPARATUS FOR THE BUFFER STORAGE AND CONVERSION OF FLAT PRODUCTS PREFERABLY OCCURRING IN STREAM FORMATION

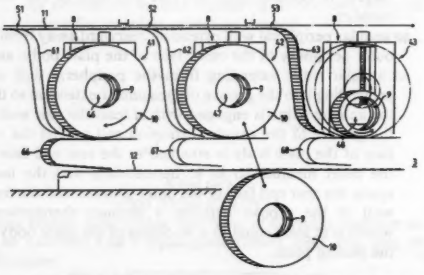
Jacques Meier, Bäretswil, Sweden, assignor to Ferag AG, Hinwil, Switzerland

Filed Dec. 23, 1988, Ser. No. 288,942

Claims priority, application Switzerland, Feb. 17, 1988, 580/88

Int. Cl.[5] B65G *37/00*

U.S. Cl. 198—347.3 10 Claims



1. An apparatus for the buffer storage of flat articles such as printed products occurring in the form of stream formations, comprising the combination of a main inlet location and a main outlet location;

buffer storage means having at least two roll modules, said roll modules (41–45) being successively arranged with respect to a feed direction and each said roll module having a roll mount (46–50) and a roll with a winding plane oriented substantially parallel to a vertical plane, each said roll mount being freely accessible from at least one side;

a first and second group of switch points (51–55, 56–60) interconnecting said buffer storage means with said main inlet and outlet; and

common feed means (11) and common removal means (12) operatively associated with each of said roll modules, said feed and removal means being substantially parallel to said winding plane.

5,004,093

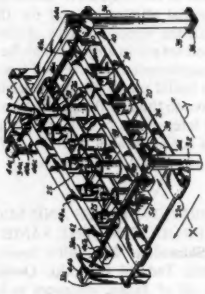
STRAIGHT LINE SORTING AND/OR FILL-TO-WEIGH MACHINE

Robert C. Blezard, Harwich Port, Mass., assignor to Charles Packaging Corporation, Lincoln, R.I.

Filed Nov. 8, 1989, Ser. No. 433,499

Int. Cl.[5] B65G *47/52*

U.S. Cl. 198—430 32 Claims



1. In a machine:

an input conveyor capable of transporting containers in an infeed direction;

a group of stations displaced from and to one side of said conveyor;

a mechanism having a longitudinal axis parallel to said infeed direction and mounted for movement transversely to said axis between said conveyor and said stations with said axis remaining parallel to said infeed direction;

said mechanism supporting drive means for effecting movement along said longitudinal axis relative to said mechanism;

a plurality of paired gripping devices, said devices being supported along and by said drive means with each pair comprising an upstream gripper and a downstream gripper and;

differential drive means operatively connected to one of each pair of grippers whereby the movement of a downstream gripper in the direction of said longitudinal axis is slower than the movement of the upstream gripper in that direction when said mechanism and said drive means position said grippers to grip a container while being moved by said conveyor.

5,004,094

APPARATUS FOR TRANSPORTING STACKS OF PAPER SHEETS TO PROCESSING MACHINES

Eckhard Brandt, Norderstedt, Fed. Rep. of Germany, assignor to E.C.H. Will GmbH, Hamburg, Fed. Rep. of Germany

Filed Apr. 8, 1987, Ser. No. 36,001

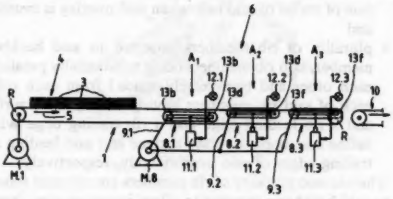
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1986, 3612021

Int. Cl.[5] B65G *47/26*

U.S. Cl. 198—460 22 Claims

1. Apparatus for delivering discrete commodities to a processing machine, particularly for delivering spaced-apart stacks of paper sheets to a packing machine, comprising a first conveyor arranged to receive groups of commodities and to advance such groups in a predetermined direction along a predetermined path; first prime mover means for driving said first conveyor; a gathering conveyor occupying a portion of said path and arranged to convert the commodities into a row on normally closely adjacent and/or actually abutting commodities and to advance the row in said direction, said gathering conveyor having a plurality of sections disposed one behind the other in said direction, means for individually moving said sections between first positions at a first level in which the

commodities in said portion of said path are carried by said first conveyor and are out of contact with said sections and second positions at a different second level in which the commodities in said portion of said path are disengaged from said first conveyor by and rest on the respective sections, and second prime



mover means for driving said sections in said direction; and singularizing conveyor means arranged to receive successive commodities of the row from said gathering conveyor and to advance the received commodities in substantially uniformly spaced-apart positions toward the processing machine.

5,004,095

APPARATUS FOR USE IN VARIABLE OPERATING TEMPERATURES

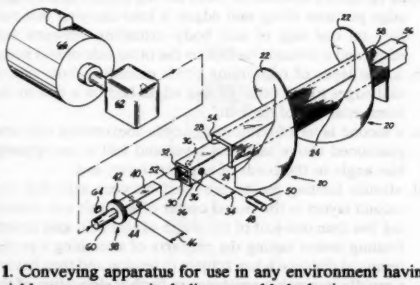
James M. Lapeyre, New Orleans; Peter G. Weber, LaPlace, and Christopher G. Greve, Covington, all of La., assignors to The Laitram Corporation, New Orleans, La.

Continuation of Ser. No. 58,917, Jun. 5, 1987, abandoned. This application May 9, 1989, Ser. No. 352,666

The portion of the term of this patent subsequent to Sep. 25, 2007, has been disclaimed.

Int. Cl.[5] B65G *33/32*

U.S. Cl. 198—660 **12 Claims**



1. Conveying apparatus for use in any environment having variable temperatures including a molded plastic screw conveyor, said plastic screw conveyor including an axial member extending a selected length, and a flight member helically encircling more than 360° of said axial member, and extending said selective length, said apparatus comprising:

a molded plastic screw conveyor having a first coefficient of expansion and including an elongated axial member extending said selected length between a pair of ends, said axial member further defining an aperture having a cross-section of a first non-circular shape extending co-axially therethrough said screw conveyor including a flight member which helically encircles more than 360° of said axial member and extends between said pair of ends;

an elongated drive shaft having a second coefficient of expansion which is different than said first coefficient of expansion, and having a perimeter cross-section of a second non-circular shape extending axially through and cooperating with said aperture of said screw conveyor to allow axial motion between said screw conveyor and said drive shaft so as to accommodate variations in length due to temperature changes, said drive shaft further including an aperture extending co-axially from at least one end of, and into said drive shaft, said aperture and said drive shaft being smaller than said perimeter cross-section and having a cross-section of a third non-circular shape;

a journal plug having a mounting end and a drive end and defining an aperture extending axially therethrough;

a retainer means cooperating with said mounting end of said journal plug and defining an aperture therethrough in register with said journal plug aperture, at least one of said cooperating journal plug and said retainer means defining a perimeter cross-section such that rotation of said journal plug causes rotation of said drive shaft; and

attaching means extending through the aperture of said retainer means and the aperture of said journal plug for applying compressive axial force to said cooperating retainer means and journal plug to cause radial expansion of said cooperating retainer means and journal plug within said drive shaft aperture thereby increasing said perimeter cross-section so as to retain said journal plug in said drive shaft aperture.

5,004,096

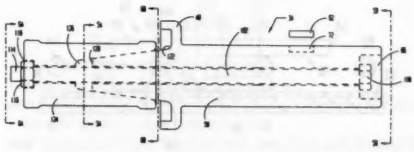
SCREW CONVEYOR COUPLING APPARATUS

James M. Lapeyre, New Orleans; Peter G. Weber, LaPlace, and Christopher G. Greve, Covington, all of La., assignors to The Laitram Corporation, Harahan, La.

Continuation of Ser. No. 58,393, Jun. 5, 1987, abandoned. This application Apr. 3, 1989, Ser. No. 332,392

Int. Cl.[5] B65G *33/32*

U.S. Cl. 198—666 **10 Claims**



1. Screw conveying apparatus including a modular screw conveyor having a multiplicity of integrally formed modules, said modular screw conveyor also including a combination axial member extending a selected length, and a flight member helically encircling more than 360° of said combination axial member and extending said selective length, said apparatus comprising:

at least two substantially similar integrally molded plastic modules, each module including an elongated axial member extending between a pair of ends and defining an aperture having a cross-section of a first non-circular shape extending coaxially therethrough, each module further including a flight member which helically encircles not more than 360° of said axial member and extends between said pair of ends, at least one end of one of said at least two modules formed to cooperate with an adjacent end of the other one of said at least two modules;

said multiplicity of modules being aligned coaxially such that, except for modules on the extreme ends, each end of each module is in axial confronting relationship with an end of an adjacent module and such that said aperture of each of said multiplicity is in register with the aperture of an adjacent module so as to define a modular screw conveyor having an elongated aperture of a non-circular cross-section extending said selected length and including a light member which encircles more than 360° of said combination axial member and substantially extends the length of said aligned modules;

an elongated drive shaft having a perimeter cross-section of a second non-circular shape extending axially through and cooperating with the in-register apertures of said aligned multiplicity of modules such that rotation of said drive shaft causes rotation of said screw conveyor, said drive

shaft further including an aperture extending coaxially from at least one end of, and into said drive shaft, said aperture in said drive shaft being smaller than said perimeter cross-section and having a cross-section of a third non-circular shape;

a journal plug having a mounting end and a drive end and defining an aperture extending axially therethrough;

a retainer means cooperating with said mounting end of said journal plug and defining an aperture therethrough in register with said journal plug aperture, at least one of said cooperating journal plug and said retaining means defining a perimeter cross-section such that rotation of said journal plug causes rotation of said drive shaft; and

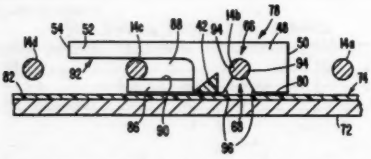
attaching means extending through the aperture of said retainer means and the aperture of said journal plug for applying compressive axial force to said cooperating retainer means and journal plug to cause radial expansion of said cooperating retainer means and journal plug within said drive shaft aperture thereby increasing said perimeter cross-section so as to retain said journal plug in said drive shaft aperture.

5,004,097

REPLACEABLE SNAP-ON MODULAR OVERLAY FOR ROD AND LINK TURN-CURVE CONVEYOR BELTS

Gerald C. Roinestad, Williamsburg, and Michael R. Straight, Winchester, both of Va., assignors to Ashworth Bros., Inc., Fall River, Mass.

Filed Jan. 30, 1990, Ser. No. 472,062
Int. Cl.[5] B65G *17/42*
U.S. Cl. 198—803.01 **8 Claims**



1. In a conveyor system having at least one ware transport section and made up of a succession of overlays for transporting articles, each overlay having an overlay body providing an upper overlay surface with leading and trailing edges and upon which said articles are supported, each overlay being supported and moved along by a belt of spaced rod members extending transversely of the direction of travel of said belt which slides upon at least one rail, the improvement comprising in combination:

forward support means depending from said overlay body for supporting said overlay body on said spaced rod members;

said forward support means including a rod member engaging means operable to receive an attachment rod member when said overlay body is moved relatively toward said attachment rod member in a direction normal to said upper overlay surface;

said rod member engaging means including at least one pair of spaced resilient legs depending from said overlay body and each of said at least one pair of legs providing an opening for receiving said attachment rod member;

holding and bearing means in said opening on each pair of said legs for holding said attachment rod member received in said opening with a snap fit and providing bearing support for loads transmitted through said forward support means; and

an anti-tipping means forwardly depending from said overlay body an effective anti-tipping distance and in slideable contact with said rail for preventing said overlay from pivoting about said attachment rod member out of the plane of said belt while said overlay travels through said transport section;

said leading edge of said upper overlay surface lying forwardly of said opening in said rod member engaging means;

said trailing edge of said upper overlay surface lying rearwardly of a trailing rod member while in said transport section and said rod members are parallel to each other;

said overlay body comprising

a backbone member extending transversely of the direction of travel of said belt when said overlay is installed, and

a plurality of rib members attached to said backbone member, said rib members being substantially parallel to each other and transversely spaced from each other, each of said rib members having an upper rib surface and a rib leading edge and a rib trailing edge which define said upper overlay surface and said leading and trailing edges of said overlay body, respectively,

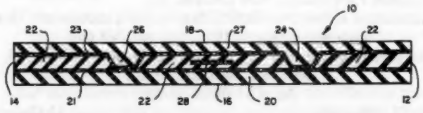
wherein said plurality of rib members are oriented relative to said backbone member to allow interdigitation thereof with rib members of overlays immediately ahead and behind said overlay on said belt.

5,004,098

CONVEYOR BELT

Gary C. Marshall, Oil City, Pa., assignor to Joy Technologies Inc., Pittsburgh, Pa.

Filed Apr. 21, 1989, Ser. No. 341,613
Int. Cl.[5] B65G *15/34*
U.S. Cl. 198—847 **6 Claims**



1. A stretchable conveyor belt, comprising:

a. an elongated elastomeric body having spaced-apart edges, edge portions along said edges, a load-carrying belt surface on one side of said body extending between said edges and a drivable surface on the other side of said body;

b. a first layer of reinforcing cords extending from one of said edges to the other of said edges laid on a bias to the transverse axis of the belt;

c. a second layer of reinforcing cords coextensive with and positioned above said first layer and laid at an opposite bias angle to the cords of said first layer; and

d. stretch limiting means provided between said first and second layers in the lateral center of said belt and extending less than one-half of the width of said belt, said stretch limiting means having the property of stretching a predetermined distance when subject to tension and then having a rapidly increasing resistance to further elongation of the belt in operation, said stretch limiting means comprising an elongated fabric member constructed of angularly woven, high strength fibers.

5,004,099

PAPER ITEM RECEPTACLE

Dewey Carpenter, 5780 SW. 14th St., Plantation, Fla. 33317, and Kathryn Ehster, 925 Crowsnest Cir., #36, Orlando, Fla. 32825

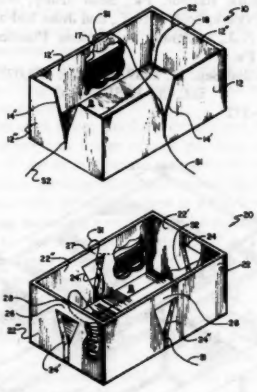
Filed Sep. 5, 1989, Ser. No. 402,679
Int. Cl.[5] B65B *13/02*
U.S. Cl. 206—83.5 **3 Claims**

1. A paper item storage receptacle adapted to receive a stack of paper items to be recycled, comprising:

a generally rectangular, open-top container having four vertical adjoining aide walls and a bottom horizontal panel connected therebetween;

wherein each of two of said side walls define a generally V-shaped cutout therein;

at least one segment of tie string having free ends is disposed within at least one of said V-shaped cutouts and draped across the bottom panel of said receptacle, said segment of tie string adapted to secure the stack of paper items in a



secured bundle once the free ends of said segment of tie string are connected together;

wherein the V-shaped notches are truncated by handle means for holding said receptacle.

5,004,100

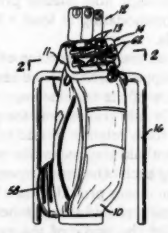
GOLF CLUB AND BAG SECURITY DEVICE

Donald E. Smith, 8325 Leeds St., Downey, Calif. 90242

Filed Apr. 3, 1990, Ser. No. 503,703

Int. Cl.[5] A63B *55/00, 57/00*

U.S. Cl. 206—315.2 **23 Claims**



1. A security device for releasably securing a plurality of golf clubs therein, each golf club having a head disposed at the end of a shaft, the shaft having a narrow region near the head and a wider region farther from the head, the device comprising:

a plate and arm shaped for cooperative engagement so that, when arranged in an engaged position, portions of their respective perimeters mutually define a through-cut slot closed at each end for securing the club shafts, the length of the slot being substantially greater than its width and the width of the slot being greater than a single club's narrow region and less than a single club's wider region;

said plate and arm each having a first connecting portion and a second connection portion, said first connecting portions each having a hole defined therein for receiving a padlock shackle and aligned in opposed relationship with the hole of the other when said plate and arm are arranged in said engaged position;

said plate comprising a plurality of tongues connected at one end of the plate and extending therefrom so as to define a number of said slots equal to one less than the number of tongues, said arm connecting the ends of at least two of said tongues when arranged in said engaged position; and

means for joining said second connecting portions when said plate and arm are arranged in said engaged position.

5,004,101

BELTABLE PLASTIC CASING FOR ELECTRIC PLUG CONNECTORS

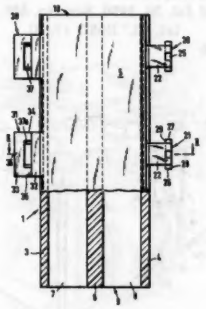
Andreas Neumann, Wuppertal, and Michael Wiese, Remscheid, both of Fed. Rep. of Germany, assignors to Grote & Hartmann GmbH & Co. KG, Wuppertal, Fed. Rep. of Germany

Filed Nov. 2, 1989, Ser. No. 430,766

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1988, 8814029[U]

Int. Cl.[5] B65D *85/24, 73/02*

U.S. Cl. 206—343 **15 Claims**



1. An individual casing comprising:

said casing being fabricated from plastic;

said casing being provided with casing chambers for reception of electric plug connectors;

said casing having a bottom wall and first and second side walls connected to said bottom wall, said first and second side walls being parallel to each other, said first and second side walls being perpendicular to said bottom wall;

inner surfaces of said bottom wall and said first and second side walls providing walls for said casing chambers;

a cover wall disposed on said first and second side walls opposite said bottom wall to provide a top wall for said casing chambers;

said first and second side walls having snap-together engagement means to securely connect said casing to other casings in a side-by-side arrangement to form a casing belt which can be wound into a coil;

said snap-together engagement means including a first rest arrangement on said first side wall and a second rest arrangement on said second side wall;

said first arrangement including at least one hook-shaped rest finger, said rest finger including a first connecting strip molded to an outer surface of said first side wall and a rest strip molded to said first connecting strip, said first connecting strip projecting perpendicularly outward from said outer surface of said first side wall, said rest strip extending vertically upward from said first connecting strip in a direction toward said cover wall, said rest strip being disposed parallel to said first side wall;

a vertical length of said first side wall being disposed between said bottom wall and said cover wall, said vertical length being longer than said rest strip;

said second rest arrangement including at least one lug member, said lug member including a second connecting strip molded to an outer surface of said second side wall and a bow portion molded to said second connecting strip; and

said bow portion being provided with recess means for receiving a rest strip of a hook-shaped rest finger of a first

adjacent casing in a snap-together relationship to securely connect said individual casing and said first adjacent casing together;

and said rest strip of said hook-shaped rest finger of said individual casing can be received in a bow portion of a lug member of a second adjacent casing in a snap-together relationship to securely connect said individual casing and said second adjacent casing together whereby said second adjacent casing, said individual casing and said first adjacent casing are disposed in a side-by-side arrangement to form a casing belt.

5,004,102

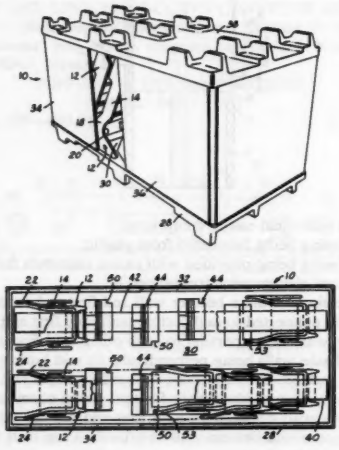
RACK FOR TRANSPORTING VEHICLE CENTER CONSOLE ASSEMBLIES

Lawrence J. Timmins, Riverview, and Duane K. Krause, Grosse Pointe Woods, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Jul. 30, 1990, Ser. No. 559,773

Int. Cl.[5] B65D *19/00*

U.S. Cl. 206—386 **5 Claims**



1. A shipping rack including a base having a generally horizontal loading surface, a plurality of spaced apart supports secured on the loading surface, each support being for receiving and supporting a vehicle center console assembly which includes an elongated body having a longitudinal axis, an enlarged portion at one end of the elongated body having a recess therein, the recess being partially defined by a pair of spaced apart side walls each of which terminates in an outer edge which is at an acute angle with respect to the longitudinal axis of the elongated body, the supports each being a block-like member having an exterior configuration matching the interior configuration of the recess of the enlarged portion of the vehicle center console assembly to receive a vehicle console assembly thereon with the outer edges of said side walls resting on the shipping rack loading surface and the longitudinal axis of the elongated body at an acute angle with respect to the loading surface, the supports being arranged in at least one row on the shipping rack loading surface, each support being spaced apart longitudinally on the shipping rack loading surface with respect to adjacent supports and being spaced apart slightly laterally on the shipping rack loading surface with respect to adjacent supports, each support having a vertical notch in one corner, the notches of adjacent supports being provided in alternating corners to receive alternating corners of the side walls of a vehicle center console assembly mounted on adjacent supports and laterally secure the vehicle center console in place and prevent contact therebetween.

5,004,103

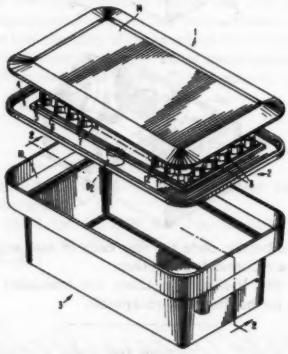
TOOL STORAGE BOX

Peter J. Connors, Radnor, Pa.; Sean Scully, Nanuete; Frank Bria, West Nyack, both of N.Y., and John ReFalo, III, Basking Ridge, N.J., assignors to Remcon Plastics, Inc., Conshohocken, Pa.

Filed Sep. 11, 1989, Ser. No. 405,025

Int. Cl.[5] B65B *85/20*

U.S. Cl. 206—372 **18 Claims**



1. A storage and tote box for tools, the storage and tote box comprising:

container means for accommodating a plurality of tools,

tray means adapted to be disposed in said container means for suspending the respective tools in the said container means,

a plurality of through hole means provided in said tray means for accommodating at least a body portion of the respective tools,

means provided on an upper surface of the tray means for supporting an upper portion of the respective tools above an upper surface of the tray means,

means provided in said tray means for positionally locking the respective tools relative to said tray means, and

means provided on said tray means for preventing said tools from contacting each other in a suspended position including an extension means provided on a lower surface of the tray means at each of said through hole means for engaging a portion of the body of the respective tools, and wherein said extension means includes mean for positionally locking the respective tools relative to the tray means.

5,004,104

MULTI-UNIT PACKAGE PARTICULARLY FOR PARALLELEPIPED CARTONS

Alain Saulas, Chateauroux, France, assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 30, 1990, Ser. No. 502,606

Claims priority, application United Kingdom, Mar. 30, 1989, 8907185

Int. Cl.[5] B65D *5/04*

U.S. Cl. 206—526 **6 Claims**

1. A pair of nested carton blanks, each of said blanks being adopted to form a package for accommodating a plurality of parallelepiped cartons, and comprising:

a top wall panel;

a bottom wall panel;

a pair of spaced side wall panels interconnecting said top wall panel and said bottom wall panel to form a tubular

structure in which said parallelepiped cartons may be accommodated, each of said side wall panels having upper, lower and end edges;

an end wall panel connected to each of said end edges to at least partially close the ends of said tubular structure;

said tubular structure having corners formed by one of said side wall panels and an adjacent one of said end wall panels, said corners defining upper and lower corner portions and extending a full height of the cartons to be accommodated therein;

each of said upper and lower edges of each of said side wall panels defining a recess into said side wall panel adjacent each of said corners;

said recesses each being sized and positioned to correspond to said upper and lower corner portions, whereby said recesses of one of said blanks may receive said upper and lower corner portions of another one of said blanks so that said blanks may be nested when in a flat form.

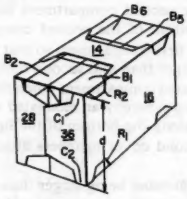
2. A package including a wrapper and a plurality of substantially identical parallelepiped cartons of a predetermined height, said wrapper comprising:

a top wall panel;

a bottom wall panel;

a pair of spaced side wall panels interconnecting said top wall panel and said bottom wall panel to form a tubular structure in which said parallelepiped cartons may be accommodated, each of said side wall panels having upper, lower and end edges;

an end wall panel connected to each of said end edges to at least partially close the ends of said tubular structure;



said tubular structure having corners formed by one of said side wall panels and an adjacent one of said end wall panels, said corners defining upper and lower corner portions and extending said height of said cartons to be accommodated therein;

each of said upper and lower edges of each of said side wall panels defining a recess into said side wall panel adjacent each of said corners;

said recesses each being sized and positioned to correspond to said upper and lower corner portions, whereby said recesses of said wrapper may receive said upper and lower corner portions of an adjacent and substantially identical wrapper so that said wrappers may be nested when in a flat form.

6. A package including a wrapper and a plurality of substantially identical parallelepiped cartons of a predetermined height, said wrapper comprising:

a top wall panel;

a bottom wall panel;

a pair of spaced side wall panels interconnecting said top wall panel and said bottom wall panel to form a tubular structure in which said parallelepiped cartons may be accommodated, each of said side wall panels having upper, lower and end edges defining a width extending between said edges;

an end wall panel connected to each of said end edges to at least partially close the ends of said tubular structure;

said tubular structure having corners formed by one of said side wall panels and an adjacent one of said end wall panels, said corners defining upper and lower corner portions and extending said height of said the cartons to be accommodated therein;

said top and said bottom panels each having a width less than said width of said side wall panels;

each of said end wall panels, said top and said bottom panels being formed whereby an end wall panel of said wrapper may be positioned adjacent one of said top and said bottom panels of an adjacent and substantially identical wrapper so that said wrappers may be nested when in a flat form.

5,004,105

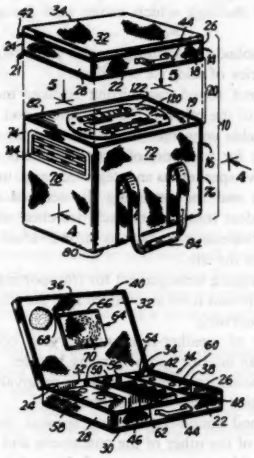
PACKAGING ARRANGEMENT FOR TRANSPORTING AUDIO SYSTEM COMPONENTS TO AND FROM AN OUTDOOR MARINE SITE

Tommyca Freadman, 16 Glen Dr., Goshen, N.Y. 10924

Filed Mar. 16, 1990, Ser. No. 495,261

Int. Cl.[5] B65D *85/30*

U.S. Cl. 206—576 **24 Claims**



1. A packaging arrangement for transporting audio system components to and from an outdoor site, particularly a marine location, comprising:

(a) a pair of weather-resistant carrying containers, each having an interior;

(b) a first sound-transmitting speaker removably mounted in the interior of one of the containers;

(c) a second sound-transmitting speaker mounted in the interior of the other of the containers; and

(d) detachable connector means for securing the containers together for transport of both containers carrying their respective speakers as an integrated cargo unit to and from the site, and for detaching the secured containers for independent transport of each detached container carrying its respective speaker as an individual cargo unit to and from the site, said detachable connector means including connector portions engaging each other when the containers are secured together, and disengaged apart from each other when the containers are detached.

11. A packaging arrangement for transporting audio system components to and from an outdoor site, particularly a marine location, comprising:

(a) a pair of weather-resistant carrying containers, each having an interior, one of the containers having a plurality of partitions removably mounted within, and subdividing,

the interior of said one container to form individual storage compartments;

(b) a first sound-transmitting speaker removably mounted in the interior of said one container;

(c) a second sound-transmitting speaker mounted in the interior of the other of the containers; and

(d) detachable connector means for securing the containers together for transport of both containers carrying their respective speakers as an integrated cargo unit to and from the site, and for detaching the secured containers for independent transport of each detached container carrying its respective speaker as an individual cargo unit to and from the site.

14. A packaging arrangement for transporting audio system components to and from and outdoor site, particularly a marine location, comprising:

(a) a pair of weather-resistant carrying containers, each having an interior, one of the containers including a cover mounted for movement between open and closed positions in which access is permitted and denied respectively, and a pouch mounted on the cover and having an access opening through which cables pass for storage in the pouch;

(c) a first sound-transmitting speaker removably mounted in the interior of said one container;

(c) a second sound-transmitting speaker mounted in the interior of the other of the containers; and

(d) detachable connector means for securing the containers together for transport of both containers carrying their respective speakers as an integrated cargo unit to and from the site, and for detaching the secured containers for independent transport of each detached container carrying its respective speaker as an individual cargo unit to and from the site.

16. A packaging arrangement for transporting audio system components to and from an outdoor site, particularly a marine location, comprising:

(a) a pair of weather-resistant carrying containers, each having an interior and a carrying handle;

(b) a first sound-transmitting speaker removably mounted in the interior of one of the containers;

(c) a second sound-transmitting speaker mounted in the interior of the other of the containers; and

(d) detachable connector means for securing the containers together for transport of both containers carrying their respective speakers as an integrated cargo unit to and from the site, and for detaching the secured containers for independent transport of each detached container carrying its respective speaker as an individual cargo unit to and from the site.

17. A packaging arrangement for transporting audio system components to and from an outdoor site, particularly a marine location, comprising:

(a) a pair of weather-resistant carrying containers, each having an interior;

(b) a first sound-transmitting speaker removably mounted in the interior of one of the containers;

(c) a pair of second sound-transmitting speakers, a frequency cross-over network, an electrical amplifier and means for conducting waste heat away from the amplifier, all mounted in the interior of the other of the containers; and

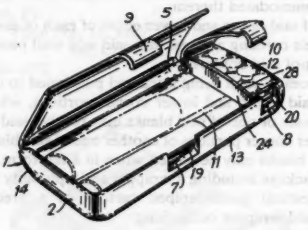
(d) detachable connector means for securing the containers together for transport of both containers carrying their respective speakers as an integrated cargo unit to and from the site, and for detaching the secured containers for independent transport of each detached container carrying its respective speaker as an individual cargo unit to and from the site.

5,004,106

MULTI-COMPARTMENT CONTAINER

Judith E. Blumstock, and Leslie P. Morgan, both of New York, N.Y., assignors to Protection Protection, Inc., New York, N.Y.

Filed Feb. 14, 1990, Ser. No. 480,115
Int. Cl.[5] B65D *69/00*
U.S. Cl. 206—581 **9 Claims**



1. A multi-compartment container comprising:

(a) a body member made of one piece of molded plastic shaped to form an elongated box-like shape having a flat bottom side and four upwardly disposed sides thereon wherein said four sides and said bottom form a first compartment;

(b) a partition attached inside to at least one of said sides of said body member forming a second compartment nested within the first compartment, said partition providing a side and bottom for the second compartment wherein the bottom of the second compartment defines a space between the bottom of the second compartment and the bottom of the first compartment so that the first compartment being larger than said second compartment extends under said second compartment when the container is in a normal position whereby an elongated article can extend substantially along the bottom of the first compartment;

(c) first and second cover members attached to said body member,

said first cover member being larger than said second cover member and permitting access to said first compartment and

said smaller second cover member permitting access to said second compartment.

5,004,107

EARTHQUAKE BRACED RACKS

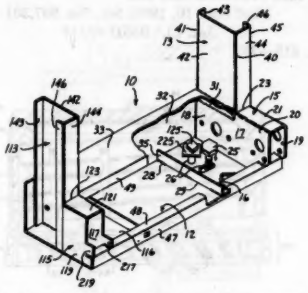
Richard W. Sevier, Goleta, and James J. Keenan, Santa Barbara, both of Calif., assignors to Hendry Mechanical Works, Goleta, Calif.

Filed May 5, 1989, Ser. No. 347,672
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—26 **29 Claims**

1. In a method of bracing an electronic equipment rack including a horizontal frame member and a vertical frame member against earthquake damage, the improvement comprising in combination the steps of:

providing a metal gusset for said horizontal and vertical frame members wherein the gusset has a first leg fitting against said horizontal frame member to extend along part of that horizontal frame member, a second leg integrally connected to and extending from a lateral edge of the first leg and fitting against said vertical frame member for a first part of said second leg to extend along part of that vertical frame member, a third leg spaced from and extending in parallel to a second part of said second leg, and a fourth leg extending between and integrally connected to lateral edges of said second and third legs to abut against another part of said vertical frame member; and

carrying solid metal from said vertical frame member to said horizontal frame member by intimately connecting said



gusset to said vertical and horizontal frame members by overlap welding.

5,004,108

CRANES

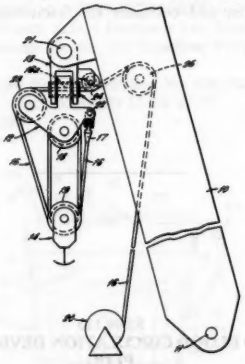
Hendrik Van Ketel, Maassluis, Netherlands, assignor to 501 Heerema Engineering Service B.V., Leiden, Netherlands

Filed Mar. 22, 1989, Ser. No. 327,337

Claims priority, application United Kingdom, Apr. 8, 1988, 8808233

Int. Cl.[5] B66C *23/06*; B66D *03/08*

U.S. Cl. 212—255 **4 Claims**



1. In a crane of the kind having a boom or sheerleg which is mounted for pivotal movement about a first horizontal axis, an upper block assembly suspended from said boom or sheerleg, a lower block assembly, a cable system suspending the lower block assembly from the upper block assembly and having at least one cable extending therebetween, and winching means remote from said upper and lower block assemblies for winching in and paying out said cable to raise and lower the lower block assembly, the improvement comprising a joint assembly between the upper block assembly and the boom or sheerleg having first pivotal connection means between the joint assembly and the boom or sheerleg for pivotal movement of the joint assembly and upper block assembly about a second axis parallel to the first axis, and said second pivotal connection means comprises a hollow shaft to allow said cable to pass through the connection means and guide means mounted on respectively said upper block assembly and joint assembly for guiding the cable leading between said cable system and the winching means through said hollow shaft along the third axis so that a part of said cable extends in the direction of said third axis at a position perpendicular to said second axis.

5,004,109

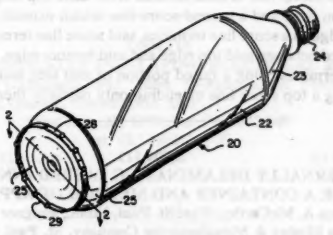
BLOWN PLASTIC CONTAINER HAVING AN INTEGRAL SINGLE THICKNESS SKIRT OF BI-AXIALLY ORIENTED PET

Harold D. Bartley, Springfield, and William R. Gaiser, Dayton, both of Ohio, assignors to Broadway Companies, Inc., Dayton, Ohio

Division of Ser. No. 157,449, Feb. 19, 1988, Pat. No. 4,861,260. This application Jul. 3, 1989, Ser. No. 374,704

Int. Cl.[5] B65D *1/02, 23/00*

U.S. Cl. 215—1 C **2 Claims**



1. A blow-molded carbonated beverage bottle formed from a preform of PET material, comprising:

a top,

a cylindrical side wall of generally uniform thickness,

a generally spherical pressure bottom,

said bottom having a generally constant thickness across its width corresponding to said side wall thickness,

a single thickness annular support skirt formed as an integral part of said bottom and extending generally axially of said bottle from said bottom at a location radially inward of said side wall,

said skirt being formed of bi-axially oriented PET material and having a radial thickness about the same as that of said bottom, and

said skirt terminating at a lower surface defining means for supporting the bottle in an upright position.

5,004,110

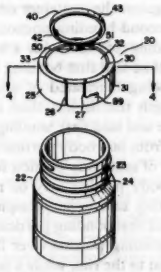
RETORTABLE CLOSURE FOR PLASTIC CONTAINER

Thomas W. Osip, Worthington, Ohio; Jerold W. Montgomery, Libertyville, Ill., and Paul A. Pezzoli, Worthington, Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Aug. 3, 1989, Ser. No. 388,889

Int. Cl.[5] B65D *51/20*

U.S. Cl. 215—232 **15 Claims**



1. A closure for plastic containers having an annular lip, said closure comprising a generally cylindrical side wall, said side

wall having an outer surface and an inner surface, said closure having retaining means located adjacent said inner surface for cooperative engagement with said lip, and a top, said top having a center portion removal means, an annular rim portion and a center portion, said center portion removal means secured to said center portion and said center portion removal means comprising a ring and a ring base said ring having an inner ring wall, said ring base including a pair of angled outer walls flanking a central outer wall, said central outer wall and angled outer walls featuring an area of depression, said top having a lower surface attached to a heat sealable barrier, said heat sealable barrier able to be secured to said container and comprising an impervious layer between layers of a heat sealable material, said side wall having a top edge and a bottom edge, said side wall having a plurality of score lines including a first score line which extends from said top edge to said bottom edge and a second score line which extends from said top edge to a score line terminus, said score line terminus being located between said top edge and said bottom edge, said score line terminus being a raised portion of said side wall, said top having a top score line extending only partially therethrough.

5,004,111

INTERNALLY DELAMINATING TABBED INNERSEAL FOR A CONTAINER AND METHOD OF APPLYING

Theresa A. McCarthy, West St. Paul, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Feb. 27, 1989, Ser. No. 314,392
Int. Cl.[5] B65D *51/18*
U.S. Cl. 215—232 **28 Claims**

1. An improved easy opening innerseal for use with a container of the type having an opening defined by an upper rim, comprising:

a body portion having an upper surface and adapted for fitting over an upper rim of a container, said body portion including membrane means for preventing passage of fluid through said body portion; and means adapted for bonding said body portion against the upper rim of the container; said bonding means having a first bonding portion for bonding against the container rim with a first bonding force and a second bonding portion which is adhered to said first bonding portion with a second bonding force which is less than said first bonding force, said first bonding portion being fabricated of a material which has a rupture strength that is less than either of said second bonding force and said first bonding force; and

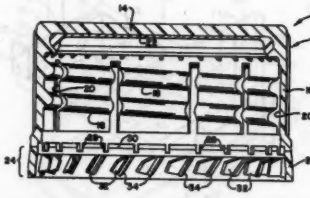
means separate from said body portion and connected to said upper surface of said body portion for grasping by a user, so that said body portion may be removed from a container by pulling said upper grasping means, wherein a first part of said first bonding portion will delaminate from said second bonding portion over the container rim and remain adhered to the rim, while a second part of said first bonding portion will remain adhered to said second bonding portion, thereby exposing the opening.

5,004,112

TAMPER-INDICATING PLASTIC CLOSURE

Stephen W. McBride, Brownsburg, Ind., assignor to H-C Industries, Inc., Crawfordsville, Ind.

Filed Apr. 10, 1990, Ser. No. 507,301
Int. Cl.[5] B65D *41/34*
U.S. Cl. 215—252 **10 Claims**



1. A tamper-indicating closure for a container having an annular locking ring, comprising:

a plastic closure cap having a circular top wall portion, and a depending cylindrical skirt portion; and

an annular pilfer band depending from and at least partially detachably connected to said skirt portion by frangible means,

said pilfer band including a plurality of circumferentially spaced, inwardly extending flexible projections, each of said projections being movable about respective, non-horizontal hinge means,

said pilfer band further including interference means operatively associated with said circumferentially spaced flexible projections, said flexible projections being engageable with said interference means during removal of said closure from said container for fracturing said frangible means.

5,004,113

PLUG AND BLOOD CIRCULATION DEVICE WITH THE PLUG

Atsuhiko Nogawa, Fuji, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1989, Ser. No. 304,593
Claims priority, application Japan, Feb. 3, 1988, 63-23354
Int. Cl.[5] B01D *13/00*
U.S. Cl. 215—358 **13 Claims**

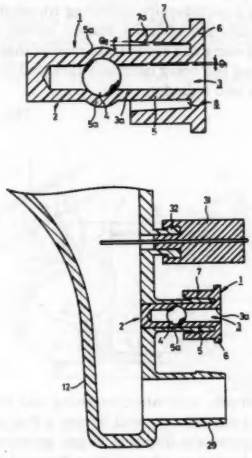
2. A plug comprising:

a plug body having a column member made of a soft resilient material;

a core made of a material harder than said soft material of the plug body and disposed in said column member, said core displacing a portion of said column member outwardly and forming an outwardly bulging portion of said column member;

said column member having a partition wall at one end thereof, said partition wall and an outer wall surface of said column member jointly defining therebetween a groove receptive of a projection of a female member into which the plug body can be fitted;

said partition wall having a length measured parallel to said outer wall surface which is substantially longer than a



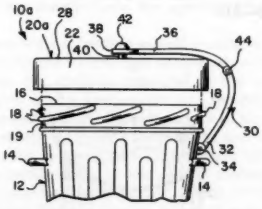
width of said groove measured perpendicular to said outer wall surface.

5,004,114

TRASH CAN WITH TETHERED COVER

Rosemarie Terbrusch, R.D. 4 Blueberry La., South Salem, N.Y. 10590, and George Spector, 233 Broadway #3815, New York, N.Y. 10007

Filed Nov. 2, 1989, Ser. No. 430,783
Int. Cl.[5] B65D *55/16, 41/06*
U.S. Cl. 220—296 **1 Claim**



1. A trash container comprising:

(a) a pail with a vertical axis having a pair of carry handles and an open top for receiving trash therein;

(b) a first engaging means disposed on outer surface about the open top of said pail;

(c) a cover having a center and a depending skirt being of a size to fit about the open top of said pail;

(d) a second engaging means disposed on inner surface of the depending skirt of said cover and adapted to interlock with said first engaging means to tightly secure said cover to the open top of said pail so that it will prevent an animal from entering through the open top of said pail to eat the trash therein; wherein said first engaging means is a plurality of interrupted twist threads while said second engaging means is an appropriately aligned plurality of lug wedge shaped members which are interlocked by rotation of said cover in a plane substantially perpendicular to the vertical axis of said pail over which said cover is placed; further comprising:

(e) a U-shaped arm having a distal end pivoted about a horizontal axis to side of said pail below said twist threads and a proximate end which terminates into a washer-like portion;

(f) a pivot pin having an enlarged head fits through the washer-like portion of said U-shaped arm and into center of said cover, allowing said cover to rotate about said vertical axis;

(g) a hinge connecting said distal end and said proximate end whereby said proximate end can bend away from said pail for removal of said cover;

(h) a pointer disposed onto the washer-like portion; and

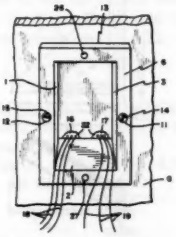
(i) a marker line disposed onto the top surface of said cover extending radially from said pivot pin so as to line up with said pointer to indicate that said lug wedge-shaped members are in proper alignment with said twist threads when said cover is placed over the open top of said pail.

5,004,115

ACOUSTICALLY INSULATING ELECTRICAL BOX

Ghislain L'Heureux, 911, Rang St-Antoine, St Féréol Les Neiges, Quebec, Canada G0A 3R0

Filed Apr. 25, 1989, Ser. No. 342,909
Int. Cl.[5] H02G *3/08*
U.S. Cl. 220—3.3 **12 Claims**



1. In the combination of an electric box with a building wall or ceiling board having a front surface and an opening therein, said electric box comprising:

(a) a box-like wall structure having an open face and comprising at least one aperture through which electrically conducting wires enter the electrical box;

(b) means for attaching the said wires to the box-like structure; and

(c) a planar flange extending outwardly around all of the open face of the box-like wall structure, said planar flange having a back surface and being so dimensioned as to extend over the front surface of the wall or ceiling board when said box-like wall structure is inserted into said board opening,

the improvements wherein

the box-like wall structure of said electric box is non perforated except for said at least one aperture; and

said combination further comprises:

(e) means for sealing said at least one aperture with the electrically conducting wires therein to prevent transmission of acoustic waves through the said at least one aperture of the box-like wall structure; and

(f) fastener means for attaching the said electrical box directly on said board with the said flange and board overlapping each other around all of the board opening and with a sealing compound pressed between the box flange and said board around all of the board opening, fastener means comprising a plurality of fasteners U-shaped in cross-section and each defining two leg members with respective, coaxial holes, each U-shaped fastener being positioned on a corresponding edge of the board opening with the leg members thereof on opposite sides of the board, the fastener means further comprising screws each driven through the box flange, the said board and the

coaxial holes of a corresponding one of said U-shaped fasteners, in order to fixedly attach the electrical box to the board while pressing the sealing compound between the back surface of the flange and the front surface of the board to form an acoustic wave-tight joint between said flange and said board;

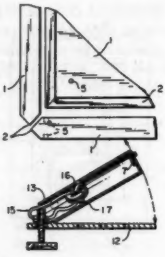
whereby said non-apertured box-like wall structure with each of said at least one aperture sealed by said sealing means and with said sealing compound pressed between said flange and said board around all of the board opening to form an acoustically insulating combination preventing the existence of direct structural acoustic short circuit.

5,004,116

MODULAR SECTIONAL CONTAINER WHICH CAN BE TRANSPORTED MANUALLY, FOR CONSERVING SUBSTANCES, IN PARTICULAR FOR ALIMENTARY USE

Andrea Cattarozzi, Via della Mattonaia, 21, Florence, Italy

Filed Aug. 29, 1989, Ser. No. 400,207
Claims priority, application Italy, Sep. 2, 1988, 11716/88[U]
Int. Cl.[5] A47F *5/00*; B65D *6/12*
U.S. Cl. 220—4.34 **2 Claims**



1. Modular sectional container for conserving substances and which can be transported manually comprising:

panels made of insulating material, each panel forming a wall thereof, wherein a perimetral edge of each panel is V-shaped and defined by two converging faces of said edge, having an angle of 90° between them, there being formed along the edge of each panel two continuous grooves to accommodate tridimensionally extending sealing means having a shape as that of said container in a vicinity of corners of said panel and on edge surfaces of said panels and wherein there is provided an engaging seat for a connection means that joins at least three panels together;

wherein said connection means are angle elements having three orthogonal faces from each of which projects a male connecting element designed to be engaged inside said engaging seat of the panel located adjacent and mounted rotatably on said angle element so as to be anchored inside said seat by means of rotation through a predetermined angle;

wherein there is provided a base element comprising folding legs designed to be fixed, in an extended position, to one of said panels in a region of said engaging seats on its external surface; and

wherein extractable ties for binding said panels in a stacked and compact form are accommodated inside said legs.

5,004,117

SAFETY CYLINDER CAP

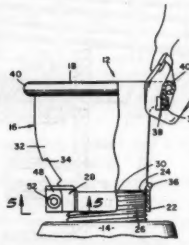
Sakae Kitsuda, 1-3-5 Nishiyawata, Hiratsuka, Japan

Filed Sep. 25, 1989, Ser. No. 412,162
Int. Cl.[5] B65D *25/00*
U.S. Cl. 220—85 P **7 Claims**

4. A safety cap for use in connection with a cylinder for containing a compressed gas, said safety cap comprising a generally bell shaped body, including:

(a) a first end having a first opening of a first size, said first end being generally circular in shape and including a including a peripherally extending rounded bead;

(b) a generally cylindrically shaped second end having a second opening of a second size smaller than said first size, said second end being internally threaded for interconnection with said cylinder;



(c) a curved side wall interconnecting said first and second ends, said curved side wall having a first aperture and a second oppositely disposed larger aperture, said second aperture having an edge portion disposed proximate said rounded bead;

(d) adjustment means for adjusting the size of said second opening; and

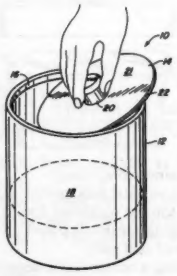
(e) gripping means disposed within said second aperture proximate said edge portion for engagement by the fingers of a person lifting the cylinder.

5,004,118

CONTAINER COVER

Eric England, and Rick DiSalvo, both of P.O. Box 148, Fairfax, Calif. 94930

Filed Dec. 4, 1989, Ser. No. 445,177
Int. Cl.[5] B65D *88/34*
U.S. Cl. 220—216 **7 Claims**



1. A cover for placement on the surface of the liquid contents of a container, said container having an inside diameter, said cover comprising:

a disc portion having a top surface and a bottom surface, said disc portion bottom surface conditioned to rest upon said liquid surface, said disc portion having a diameter slightly less than said container inside diameter;

a handle portion attached to said disc portion top surface;

a reservoir chamber attached to said disc portion, said reservoir chamber conditioned to contain a quantity of a thinning agent; and

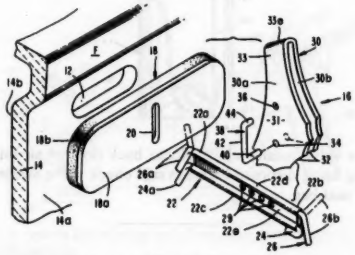
perforations enabling passage of said thinning agent from said reservoir chamber to said disc portion bottom sur-

face, so that said thinning agent is in contact with said liquid contents of said container.

5,004,119
DRAIN SEALING APPARATUS

Lawrence F. Irwin, Sylmar, Calif., assignor to Augerscope, Inc., Sylmar, Calif.

Filed Jul. 31, 1989, Ser. No. 386,633
Int. Cl.[5] B65D *45/00*
U.S. Cl. 220—247 **10 Claims**



1. An apparatus for sealably closing an aperture provided in a wall having spaced apart first and second surfaces, comprising:

(a) wall engaging means for sealably engaging the first surface of the wall at a location surrounding the aperture, said wall engaging means comprising a sealing member having an aperture therethrough and including a first rigid surface and a second yieldably deformable surface for engagement with said first surface of said wall;

(b) actuating means operably associated with said wall engaging means for moving said sealing member into sealable engagement with the first surface of the wall, said actuating means comprising:

(i) a cam support member having first and second ends and an elongated web-like intermediate portion;

(ii) a first locking element connected to said cam support member and extending outwardly from the first end thereof for insertion into the aperture provided in the wall;

(iii) an outwardly extending second locking element rotatably connected to said cam support member for insertion into the aperture provided in the wall and for movement from a first position to a second position for engagement with the second surface of the wall;

(iv) cam means rotatably connected to said cam support member for engagement with said rigid surface of said sealing member to urge said sealing member into pressural engagement with the first surface of the wall when said second locking element is in said second position.

5,004,120
DEVICE TO PROTECT THE ENDS OF FLUID TANKS MADE OF COMPOSITE MATERIALS

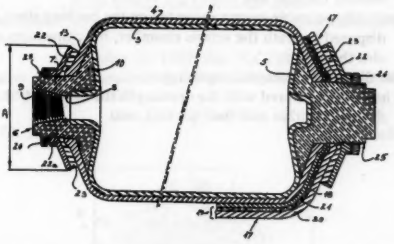
Claude L. Hembert, Quartier les Maurels, 83400 Hyeres, France

Filed May 16, 1990, Ser. No. 524,191
Claims priority, application France, May 18, 1989, 89 06761
Int. Cl.[5] B65D *25/02*
U.S. Cl. 220—414 **2 Claims**

1. A tank for containing fluid under pressure, comprising:

an inside shell 3 for ensuring imperviousness to the pressurized fluid and made of molded synthetic material; an outside shell 4, concentric with said inside shell, ensuring mechanical tolerance and made of resin reinforced by a filament winding; and at least one metal end piece having an annular collar with a frustoconical surface between said shells reinforcing at least the end of the tank endowed with an opening, with bonding between the ends of the two shells; and wherein said metal end piece further comprises a cylindrical portion coaxial with the longitudinal axis of the tank; and

a truncated protective metal collar 22 having the same conicity as said frustoconical surface of the annular collar of the joining piece and having an outside diameter at least

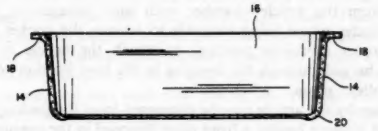


equal to that of said annular collar, said protective collar being solitary with a collet 22*a* screwed on a threading 25 provided on the outside part of said cylindrical portion; a washer 23, made of elastic material inserted between the protective collar 22 and the outside surface of the end of the tank, and a pinch nut 24 screwed on said cylindrical portion over said protective collar 22.

5,004,121
CONTROLLED HEATING BAKING PAN

David J. Howe, Milford, Mass., assignor to Proctor & Gamble Company, Cincinnati, Ohio

Filed Jan. 22, 1990, Ser. No. 467,932
Int. Cl.[5] B65D *90/04*
U.S. Cl. 220—458 **15 Claims**



1. A non-metallic paper fiber baking pan of unitary construction having a bottom wall and an endless connected side wall extending therearound at an angle to the bottom wall forming an inside corner edge portion of the pan, a portion of the pan along said inside corner edge portion and at least a portion of the side wall being thicker than other portions of the pan.

5,004,122
ARTICLE DISPENSING PACKAGE

Timothy M. Poynter, 331 Tusculum Ave., Cincinnati, Ohio 45226

Filed Jan. 18, 1989, Ser. No. 298,408
Int. Cl.[5] B65D *83/04*
U.S. Cl. 221—155 **3 Claims**

1. A display package from which articles may be dispensed, said package comprising

a relatively rigid backing sheet,

a transparent, relatively rigid, blister piece secured to said backing sheet and having a protruding portion which defines, in part, a chamber in which the articles are disposed,

the protruding portion of the blister piece having a flange disposed in a given plane from which the remainder of the blister piece protrudes, said flange being secured to the backing sheet,

whereby the blister piece, in combination with the blister sheet forms the article chamber,

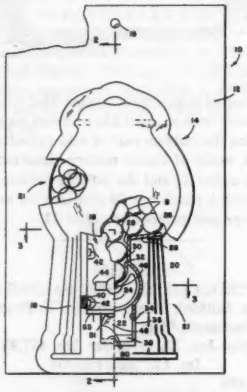
the protruding portion of the blister piece having, in elevation, the outline of an article vending machine, including an upper bowl portion, which comprises the article chamber, and a base portion,

the base portion of the blister piece having an opening formed therein, and

manually operable means, mounted on the backing sheet and disposed beneath the article chamber, for dispensing articles therefrom,

the dispensing means comprising

a housing registered with the opening in the base portion and disposed within said base portion, and



a feeder wheel rotatably mounted in said housing and having a pocket, which, in an upper position receives an article from the article chamber with said passageway, said feeder wheel being rotatable to a bring the pocket to a lower discharge position, in which the article is discharged through the opening in the base portion of the blister piece,

whereby the article may be dispensed from the package,

said housing having a front plate disposed in the opening in the blister piece and

the side edges of said opening being formed by reversely folded portions of the blister piece to provide structural strength.

5,004,123

FLUID DISPENSER WITH NON-VENTING ASPIRATOR AND BAG

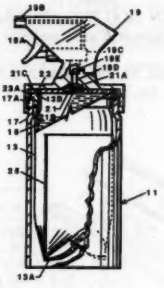
William R. Stoody, 8659 Summerdale Rd., San Diego, Calif. 92126

Filed Aug. 7, 1989, Ser. No. 390,111
Int. Cl.[5] B65D *35/22*
U.S. Cl. 222—94 **21 Claims**

1. A portable non-venting pump fluid dispenser system for isolated containment and dispensing of fluid product, which comprises:

a collapsible bag, for containment of said fluid, having an open upper end and a closed distal end;

a finger operated non-venting pump, having an inlet check valve which closes against back flow of fluid product, which facilitates said dispensing and closes said dispenser system;



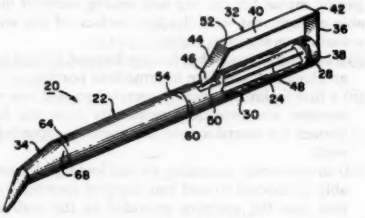
and a valve means which blocks back flow of air into said bag being disposed between said check valve and interior of said bag.

5,004,124

METHOD AND APPARATUS FOR DISPENSING A FLUID SUBSTANCE

Philip S. Stefaniak, Hanover Park, Ill., and Daniel H. Fine, Leonia, N.J., assignors to The Trustees of Columbia in The City of New York, New York, N.Y.

Filed Dec. 8, 1988, Ser. No. 281,494
Int. Cl.[5] B67D *5/52*
U.S. Cl. 222—136 **65 Claims**



1. A non-compressible fluid substance dispenser comprising

an elongate body for containing an amount of a fluid substance to be dispensed by said dispenser, including a fluid dispensing aperture,

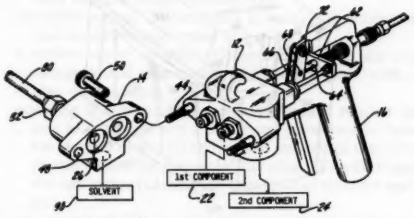
means for ejecting a fluid substance from said fluid dispensing aperture, said ejecting means comprising a first elongate member having an outer surface of a first surface hardness, and

means for actuating said ejecting means, said actuating means comprising a physically deformable elongate lever member having integral contacting means for engaging and physically deforming said outer surface to effect actuation of said ejecting means, said contacting means having a second surface hardness, said second surface hardness being greater than said first surface hardness to enable the physical deformation of said outer surface by said contacting means, such that force applied to the lever member reversibly physically deforms the lever member, causing the contacting means to contact, physically deform and firmly grip said first elongate member, and causing the contacting means to move toward said fluid dispensing aperture thereby causing said first elongate member to move toward said fluid dispensing aperture while maintaining a firm grip on the outer surface of said first elongate member.

5,004,125
MULTIPLE COMPONENT FLOW GUN

Ronald E. Standlick, Rochester, Mich., assignor to Jesco Products Company, Inc., Sterling Heights, Mich.

Continuation of Ser. No. 817,152, Jan. 6, 1986, which is a continuation of Ser. No. 748,707, Jun. 25, 1985, abandoned, which is a continuation of Ser. No. 411,902, Aug. 26, 1982, abandoned. This application Nov. 1, 1989, Ser. No. 430,765
The portion of the term of this patent subsequent to Feb. 20, 2007, has been disclaimed.
Int. Cl.[5] B67D 5/60
U.S. Cl. 222—145 12 Claims



11. In a system for mixing and dispensing two or more fluids, a gun comprising:

a housing having at least two inlet chambers;

first means to fluidly interconnect a first fluid to one inlet chamber and a second fluid to the other inlet chamber;

a mixing tube;

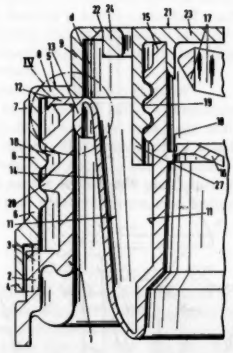
second means to fluidly connect said two inlet chambers to said mixing tube; and

said housing being formed of two parts, said two parts being detachably secured along a plane, the dispensing ratio of said first and second fluids being measurable when said two parts are detached.

5,004,126
PLASTIC CLOSURE FOR A PLASTIC CONTAINER

Konrad Klesius, Maria-Oberndorf-Strasse 5, 6501 Bodenheim, Fed. Rep. of Germany

Filed Sep. 8, 1988, Ser. No. 241,651
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1987, 3730225
Int. Cl.[5] B67B 5/00
U.S. Cl. 222—153 18 Claims

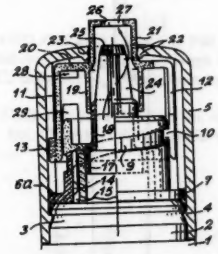


1. A plastic closure adapted to be screwed onto the neck (1) of a plastic container with a screw-on ring (5) and with an insert portion (11) comprising a flexible bellows (14) and a pour spout (15), with frame cap (21) adapted to be screwed on to an external thread (19) on the spout, characterized in that the frame cap (21) is integral with the screw-on ring (5), and the top wall (23) of the cap (21) is moulded so that it projects a distance (d) from the top wall (8) of the ring (5), said top wall (8) of said ring (5) provided with at least one raised, outwardly protruding retaining piece (9) of a height approximately equal to the distance (d) to the top wall (23) of the cap (21).

5,004,127
CAP WITH A ROTATING CASING FOR FLASKS, TUBES AND SIMILAR CONTAINERS

Simone Morel, 11 rue du Faubourg de Paris, 51210 Montmirail, Marne, France

Filed May 10, 1989, Ser. No. 350,280
Claims priority, application France, May 11, 1988, 88 06381; Mar. 17, 1989, 89 03544
Int. Cl.[5] B67D 5/32
U.S. Cl. 222—521 15 Claims



1. A cap for a neck of a container, said cap comprising a casing having a dispensing aperture, means for rotatably mounting said casing to said neck and for preventing axially longitudinal movement of said casing relative to said neck, a bell shaped member between said casing and said neck, said bell shaped member having an open position and a closed position, means of said bell shaped member and said casing for slidably connecting said bell shaped member to said casing, a sheath connected to said neck at one end and terminated by a stopper at the other end, helicoidal guiding means of said bell shaped member and said sheath for connecting said bell shaped member to said sheath, said bell shaped member having a neck part slidably disposed within said aperture upon rotation of said casing, and said neck part having an opening which is closed by said stopper when said bell is in said closed position.

5,004,128
FLEXI-NOZZLE

Thomas Richichi, and Paul Richichi, both of 1462 Coolidge St., North Bellmore, N.Y. 11710

Filed Feb. 7, 1989, Ser. No. 307,047
Int. Cl.[5] B67D 3/00
U.S. Cl. 222—527 5 Claims

1. A single-use monolithic container for sealant-type materials comprising:

(A) a monolithic container body having a rear end and a forward end, said container body storing sealant-type material and having at least a portion thereof adapted to be moved by a calker-type element to force the sealant material out of the body;

(B) a monolithic dispensing means on said body forward end and being monolithic with said body and forming a one-piece construction therewith, said dispensing means including an elongate body having a body overall length and including

(1) a non-deformable base section attached at a rear end thereof to said container body forward end to extend outwardly of said container body forward end for ½ of the body overall length and having a forward end,

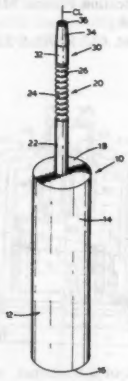
(2) a nozzle section on said elongate body forward end,

said nozzle section extending for ¼ of the body overall length and including

(a) a cylindrical entrance section and

(b) a conical dispensing section on said cylindrical entrance section, said conical dispensing section having an exit port and being shaped to converge from said entrance section towards said exit port,

(c) a flexible connecting section connecting said base section to said nozzle section and extending for ¾ of the body overall length, said connecting section including a multiplicity of accordion folded portions,



said connecting section being formed of flexible material which is ductile enough to permit said connecting section to be bent with respect to said container body and stiff enough to permit a bent connecting section to retain a bent condition as material from said container body is forced from said container body through said dispensing means, and

(3) a material passage in said dispensing means connecting the interior of said dispensing means to the interior of said container body for conducting sealant material from said container body to and through said dispensing means.

5,004,129

SELF-VENTING CONTAINER

Eugene W. Loch, Fort Wayne; David D. Ball, Yoder, and George F. Mack, Fort Wayne, all of Ind., assignors to ITT Corporation, New York, N.Y.

Filed Jan. 18, 1990, Ser. No. 466,900

Int. Cl.[5] B65D *51/16*

U.S. Cl. 220—366 **11 Claims**

1. A self-venting container comprising:

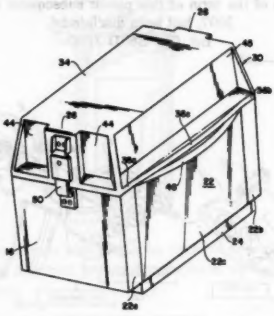
a rectangular bottom portion formed with a base and a pair of opposed bottom side walls and a pair of opposed bottom end walls, each of said walls being joined substantially perpendicularly to said base and to adjacent ones of said bottom side walls and bottom end walls so as to form a rectangular enclosure with an outer peripheral edge;

a rectangular top portion formed with a lid and a pair of opposed top side walls and a pair of opposed top end walls, each of said walls being joined substantially perpendicularly to said lid and to adjacent ones of said top side walls and top end walls so as to form a rectangular enclosure with an outer peripheral edge matched to said bottom portion outer peripheral edge; and

holding means for connecting said bottom portion in sealing contact with said top portion and securing the container in a closed condition,

wherein each of said bottom side walls is formed with a bottom central section joined with two bottom end sections on opposite ends thereof so as to form a cantilevered bottom side wall structure; and

wherein said central and end sections of said bottom side walls are constructed of a flexible material exhibiting a predetermined elongation percentage, such that the respective central sections thereof bow outwardly with a



cantilever effect relative to the end sections when excessive internal pressures in the container are exerted on the walls thereof, thereby creating a gap between the central sections of the bottom side walls and said top portion in order to allow excessive pressures contained in the container to escape, thus alleviating the internal pressures without causing a safety hazard.

5,004,130

OUTLET AND FLOW CONTROL DEVICE FOR METALLURGICAL VESSELS AND PROCESS

Arthur Vaterlaus, Rüschlikon, Switzerland, assignor to Arva AG, Rüschlikon, Switzerland

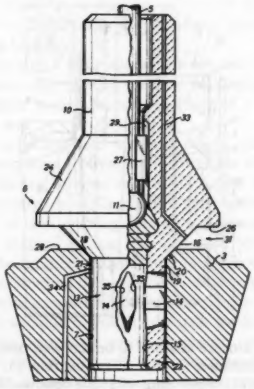
PCT No. PCT/CH87/00161, § 371 Date Aug. 31, 1988, § 102(e) Date Aug. 31, 1988, PCT Pub. No. WO88/04209, PCT Pub. Date Jun. 16, 1988

PCT Filed Nov. 27, 1987, Ser. No. 229,858

Claims priority, application Switzerland, Dec. 1, 1986, 4782/86; Sep. 30, 1987, 3805/87

Int. Cl.[5] B22D *41/10*

U.S. Cl. 222—590 **20 Claims**



1. An outlet valve structure to control flow of a metallic melt, adapted for installation in the bottom (2) of a vessel (1) containing the melt, said valve structure comprising

an essentially vertically positioned outlet pipe (3) having a vertical bore (7) therethrough;
a first sealing part (18) formed at an upper end portion of the vertical bore (7);
stopper means (6) comprising a plug (13), said plug (13) being formed with a second sealing part (16) dimensioned and shaped to fit against said first sealing part (18), said first and second sealing parts forming a first seal (20) for the melt;
a central longitudinal discharge opening (15) formed in said plug (13), said opening (15) having a lower open end discharging into said vertical bore (7);
at least one radially directed aperture (14) communicating with said discharge opening (15);
an operating rod (5) extending in vertical direction within, and outside of said vessel (1);
a hollow sleeve or stem (10) extending from said stopper means (6) and surrounding said operating rod, with radial play or clearance;
coupling link means (11) permitting limited relative deflection in a vertical and a horizontal plane located between the stopper means (6) and at least one end of the rod (5) to permit limited movement of the plug (13) with respect to the link means (11) and self alignment of said first seal (20); and
an arm means (23) coupled to the upper end of the rod (5), said arm means being positioned outside of the upper portion of the vessel, said arm means selectively transferring vertical reciprocating and rotational movement to said rod to control, respectively and selectively, vertical reciprocation of the plug (13) between the lowered position on said first seal (20) and a raised open position permitting communication between the interior of said melt containing vessel (1) and said radially directed aperture (14) and hence said discharge opening (15) and selective orientation of the radial position of said aperture with respect to said vessel.

17. A process for selectively withdrawing, or inhibiting withdrawal of molten metal, forming a melt, from a vessel, wherein the vessel includes
an outlet pipe having a vertical downwardly directed bore through which said melt can flow through gravity, and
a first sealing part formed at an upper end of the vertical bore;
and wherein
stopper means are provided, comprising a plug, the plug having a second sealing part arranged thereon, dimensioned and shaped to fit against said first sealing part to form a first seal for the molten metal;
said plug being formed with a central longitudinal discharge opening having a lower open end discharging into said vertical bore, and an essentially radially directed aperture means connecting said discharge opening with the interior of the vessel,
said process comprising the steps of
imparting to the molten metal a predominantly horizontal direction of flow in the area near said outlet pipe, and varying the angular orientation of said flow with respect to said vessel by rotating the essentially radially directed aperture means within said plug, during flow of the melt through said aperture means, said opening, and said vertical bore.

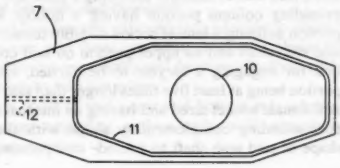
5,004,131

MOLTEN METAL SLIDE GATE VALVE

Thomas J. Russo, Kingsville, Md., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Apr. 16, 1990, Ser. No. 509,683
Int. Cl.[5] B22D *41/08*
U.S. Cl. 222—600 **2 Claims**

1. A slide gate valve for controlling the flow of molten metal comprising a stationary upper refractory plate member having a molten metal orifice, a reciprocable lower refractory slide plate having a molten metal orifice and movable in contact with the bottom face of said upper refractory plate member, the bottom face of said upper refractory plate member having



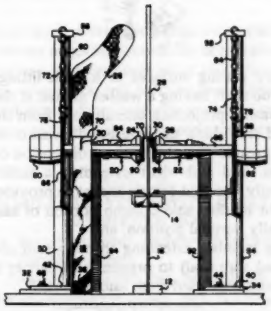
a shallow open groove extending around the entire periphery of said molten metal orifice and means for introducing a flow of a nonoxidizing gas into said groove.

5,004,132

METHOD AND APPARATUS FOR PRODUCING SOCKS

George E. Hollowell, Hildebran, and Hugh D. Sample, Newton, both of N.C., assignors to Neuville Industries, Inc., Hildebran, N.C.

Filed Jan. 24, 1990, Ser. No. 468,751
Int. Cl.[5] A41H *43/00*; D05B *65/00*
U.S. Cl. 223—1 **17 Claims**



1. A method of finishing socks utilizing a blocking machine of the type having a plurality of movable, flat sock blocking forms to receive previously knit socks having a free yarn end and to transport the socks through the blocking machine, comprising the steps of:
providing a clipping head on each side of the blocking forms in position to contact the socks on the forms;
passing the sock blocking forms with socks respectively thereon between the clipping heads; and,
operating the clipping heads to sever the free year end from each sock prior to blocking.

5,004,133

DETACHABLE ARTICLE CARRIER ASSEMBLY

Philip W. Wyers, 6476 S. Ivy Ct., Englewood, Colo. 80111

Filed Apr. 20, 1989, Ser. No. 341,124
Int. Cl.[5] B60R *9/10*
U.S. Cl. 224—42.45 R **12 Claims**

1. Bicycle carrier apparatus comprising:
a trailer hitch tongue with an aperture,
a bicycle carrier assembly detachably mounted to said tongue, said carrier assembly including
a generally vertically extending solid male stub shaft with a central internally threaded throughbore positioned in alignment with said aperture,
a removable fastener having a head portion and an externally threaded shaft portion that extends through said aperture

and threads into said stub shaft to rigidly fasten said stub shaft to said hitch tongue,

a bicycle carrier member detachably mounted to said stub shaft, said carrier member including a generally vertically extending column portion having a hollow lower end portion defining a female socket slidably telescoping over said stub shaft and an upper portion on said column portion for engaging a bicycle to be carried, said column portion being at least five times longer than said stub shaft, said female socket sized and having an internal shape of a corresponding complementary shape with the external shape of said stub shaft to provide co-operating complementary mating surfaces in a close-fitting relationship, said stub shaft having a washer affixed at the bottom end, said washer projecting laterally out from the bottom end of said stub shaft, the external dimension of said washer being greater then the external dimension of said column portion, said stub shaft extending a sufficient distance upwardly into said female socket to provide the sole support for holding said column portion of said tongue in a generally vertical position, and

a locking member extending through said column portion and said stub shaft to prevent said carrier member from becoming separated from said stub shaft.

5,004,134

BACKPACK SYSTEM FOR BEACH RELATED ACTIVITIES

Thomas P. Barry, P.O. Box 10591, Marina del Rey, Calif. 90291

Filed Feb. 6, 1990, Ser. No. 475,742

Int. Cl.[5] A45F *3/04*

U.S. Cl. 224—209 **6 Claims**

1. A backpack system comprising in combination:

(a) a substantially rectangular pliant cloth shell having four sides and a bottom with a top opening at the upper portion of said shell, said top opening enclosed by a cover, said cover secured to said shell by a first closure means to secure articles within said shell;

(b) a carrying means attached to said shell to secure said shell to the user's shoulders and back in a substantially upright position;

(c) a plurality of exterior pockets of the same material as said shell, and attached to said shell, said exterior pockets each having a pocket closure means for retaining a plurality of objects within said exterior pockets;

(d) an umbrella retaining assembly comprising

(i) an umbrella, enclosed within a sheath to form a substantially cylindrical body,

(ii) an external pouch attached to said shell and having substantially vertical sides culminating in a first opening, said first opening engaging said umbrella,

(iii) an attachment collar, attached to said cover and disposed in combination with and in a substantially concentric manner with said first opening to secure said umbrella to said shell;

(e) a connector assembly, comprising

(i) a beach chair of a substantially tubular construction,

(ii) a plurality of connectors attached to said cover, each connector having an easy open capability to releasably secure said beach chair to said cover.

5,004,135

ADJUSTABLE FRAME FOR BACKPACK

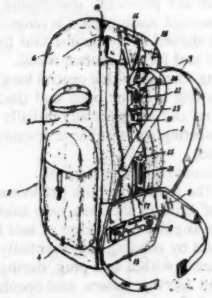
Francois Dufournet, Aix Les Bains, and Philippe Vernerey, Annecy, both of France, assignors to Societe Anonyme Dite: Millet, Seynod, France

Filed Jul. 11, 1989, Ser. No. 378,287

Claims priority, application France, Jul. 11, 1988, 88 09844

Int. Cl.[5] A45F *3/08*

U.S. Cl. 224—210 **7 Claims**



1. A backpack comprising:

a front panel adapted to lie against a back of a wearer of the backpack;

a vertical generally S-shaped guide rail fixed to the front panel generally centrally thereon and having a generally straight upper portion having an upper end provided with an upper crosspiece secured to the front panel and a generally straight lower portion lying somewhat ahead of the upper portion and having a lower end provided with a lower crosspiece secured to the front panel;

a pair of cushions flanking the rail, secured to the panel, and projecting forward therefrom past the rail;

an upper slide displaceable vertically along the rail and

provided with latch means for arresting it at any of a plurality of locations therealong;

shoulder straps adapted to engage over shoulders of the wearer of the backpack and having upper ends secured to the upper slide;

a lower slide displaceable vertically along the rail and provided with latch means for arresting it at any of a plurality of locating therealong; and

a belt adapted to engage around a torso of the wearer of the backpack and secured to the lower slide.

5,004,136

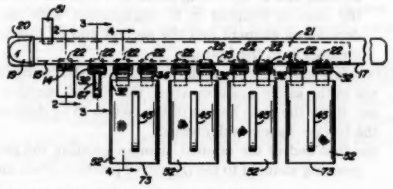
JANITORIAL UTILITY BELT FOR CARRYING SPRAY BOTTLES, GLOVES, DUSTERS, AND CLEANING TOWELS

Robert P. Leath, 405 Foxpark Dr., Pomona, Calif. 91767

Filed Jan. 23, 1989, Ser. No. 299,932

Int. Cl.[5] A45F *5/00*

U.S. Cl. 224—253 **7 Claims**



1. A janitorial utility belt comprising;

a belt adapted to encircle a user's waist, said belt having an upper edge and a lower edge,

a plurality of flat web elements attached to said belt at spaced points therealong, each web element extending downwardly beyond the lower edge of the belt and then upwardly to a fixed connection with the belt to form a loop,

a plurality of rigid connector rings, each ring comprising two vertically spaced suspension portions, each ring having its upper suspension portion extending transversely through one of said loops for attachment of said ring to the belt,

at least one hollow pouch adapted to receive therein a liquid-containment bottle and having an open upper end,

flexible strap means associated with each pouch, said strap means having lower end portions thereof attached to the associated pouch at the pouch upper end, said strap means being adapted to extend upwardly from the associated pouch, about a lower suspension portion on the associated connector rings, and then downwardly toward the pouch, said strap means having first and second facing surfaces thereof located below the associated ring, fibrous loop means extending along one of said facing surfaces, and fibrous hook means extending along the other facing surface, the two fibrous means being adapted to interlock and thereby detachably adhere the two facing surfaces together.

5,004,137

STRUCTURE OF GOLF SCORE BOARD

Jiin-Tang Wu, No. 35-1, Jih Hsin Street, Tu Cheng Hsiang, Taipei Hsien, Taiwan

Filed Jan. 12, 1990, Ser. No. 464,065

Int. Cl.[5] B60R *9/00;* **B65D** *85/00*

U.S. Cl. 224—274 **1 Claim**

1. A golf score board comprised of:

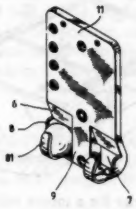
a planar member made of resilient material and having an end portion;

two openings located at said lower portion; each of said openings being bound by side walls defining a top edge, a bottom edge, an inner side edge and an outer side edge, said openings are sized so as not to allow a golf ball to pass therethrough;

said planar member including a dividing wall portion located between said openings;

a slanted face located adjacent each of said top edges of said openings, said faces extending from said planar member and slanting rearwardly and downwardly from said planar member to said top edges;

said side walls of said outer and bottom side edges of said openings extending orthogonally with respect to said planar member;



said side walls of said inner side edges of said openings extending from said planar member to said inner side edges;

a hook-like projection extending from each of said side walls of said bottom edges and outwardly of said planar member and overlying said openings so as to curve toward said openings; whereby a golf ball can be resiliently held between said slanted faces, said side walls and said hook-like projections and be easily removed therefrom.

5,004,138

AUTOMOBILE SUN VISOR WITH BUILT-IN AIR FRESHENER BOX

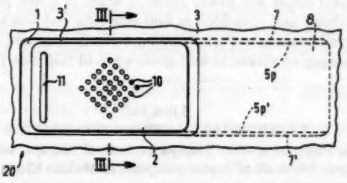
Carlos Gabas, Barcelona, Spain, assignor to Industrias Techno-Matic S.A., Barcelona, Spain

Filed Nov. 6, 1989, Ser. No. 431,923

Claims priority, application Spain, Nov. 7, 1988, 8803274[U]

Int. Cl.[5] A61L *9/12*

U.S. Cl. 224—312 **5 Claims**



1. Automobile sun visor with built-in air freshener box comprising a sun visor body provided with a box recess and a body surface and having a main axis and a main hollow container having a plurality of upper edges, said hollow container being mounted in said box recess so as to be incorporated in said sun visor body with said upper edges in the vicinity of said body surface, said container being generally aligned with said main axis of said sun visor body and said hollow container having opposing lateral guideways adjacent opposing ones of said upper edges and being provided with a sliding cover mounted in said lateral guideways located close to said upper edges, said guideways having extensions extending beyond said container sufficiently to allow for a major portion of said cover to be received in said extensions, when said cover is moved in an opening direction, and said hollow container also being pro-

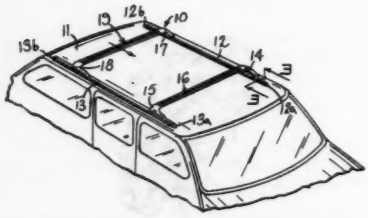
vided with means for holding an air freshener element in said hollow container.

5,004,139

VEHICLE ARTICLE HOLDER

Manfred Storm, and Greg J. Storm, both of Chesire, Conn., assignors to Hagus, U.S.A., Inc., Clinton, Conn.

Filed Sep. 15, 1989, Ser. No. 408,072
Int. Cl.[5] B60R *9/00, 9/048*
U.S. Cl. 224—324 20 Claims



10. An article carrier for a motor vehicle comprising a pair of side rails adapted to be mounted to the roof of a vehicle in spaced apart relationship and extend longitudinally of the length of the vehicle,

said side rails defining a guideway therein defined by upper and lower walls having upper and lower facing surfaces, a pair of stanchions, said stanchions supporting a cross rail therebetween generally perpendicular to said side rails,

each of said stanchions of said pair having a bottom wall with engaging means integral therewith extending therefrom and received in said guideways and slidable therein, said guideways capturing said engaging means therein and permitting only sliding movement of said engaging means therein.

a recess defined in said bottom wall of said stanchions, a clamping member received in said recess, said clamping member being rotatable in said recess and having a camming portion extending into said guideway, said upper and lower surfaces being defined by upper and lower walls each having a longitudinal passage therein, and a guide member extending from said clamping members into the longitudinal passages of said lower walls, said camming portion having means thereon arranged to engage one of said upper and lower surfaces when in a first position to clamp said stanchion in said side rails and when in a second position to permit sliding movement of said stanchion engaging means in said guideways of said side rails.

5,004,140

ELECTRICALLY-OPERATED TACKER

Fusao Fushiya; Yoshio Yokoyama, both of Nagoya, and Akihito Hara, Aichi, all of Japan, assignors to Makita Electric Works, Ltd., Aichi, Japan

Filed Apr. 23, 1990, Ser. No. 513,572
Claims priority, application Japan, Apr. 24, 1989, 1-103638; Apr. 18, 1990, 2-102469
Int. Cl.[5] B25C *1/06*
U.S. Cl. 227—8 16 Claims

1. An electrically-operated tacker comprising

(a) a driving means initially located in a starting position immediately before a first extreme position for driving a tack into an object to be tacked,

(b) means for urging the driving means toward a second extreme position opposite to the first extreme position such that the driving means can spring from the first extreme position to the second extreme position to drive the tack,

(c) an operating means for moving the driving means from the second extreme position to the starting position against an action of the urging means,

(d) an electric motor for operating the operating means,

(e) a power source for supplying an electric current to the motor,

(f) a switch for making or breaking an electrical connection between the power source and the motor, the switch having a push button,

(g) a trigger means which can be directly depressed by an operator,

(h) a first depressing element connected to the trigger means for depressing the push button of the switch to start the tacker when the trigger means is depressed by the operator,

(i) a control member of a resilient material for maintaining the first depressing element in an operative position where the first depressing element can depress the push button, the control member being movable between a safety position where a first end of the control member is out of engagement with the first depressing element and a second, opposed end of the control member is out of a housing and an operating position where the first end of the control member is in engagement with the first depressing element and the second end of the control member is in the housing,

(j) a safety means for normally maintaining the control member in the safety position where the control member does not allow the push button of the switch to be depressed if the trigger means is depressed,

the first end of the control member locating the first depressing element to the operative position when the first

end thereof comes into engagement with the first depressing element,

(k) a first cooperative element which is moved as the operating means moves and is located to engage with the control member, at substantially the same time that the driving means springs from the first extreme position to the second extreme position, such that the first end of the control member is forced out of the engagement with the first depressing element to displace the first depressing element from the operative position to an inoperative position where the first depressing element no longer depresses the push button,

(l) a second depressing element connected to the trigger means,

the second depressing element coming into engagement with the push button which has already been depressed by the first depressing element, at the same time that the driving means moves away from the first extreme position, and holding the push button depressed after the first depressing element has been displaced to the inoperative position,

(m) a second cooperative element which is moved as the operating means move,

(n) a third cooperative element which is moved as the driving means moves and is operatively associated with the second cooperative element,

the second cooperative element coming into engagement with the third cooperative element, after the driving means has reached the second extreme position, and remaining in the engagement with the third cooperative

element until the driving means comes to a substantially middle position,

(o) a fourth cooperative element which is moved as the driving means moves and is operatively associated with the first cooperative element,

the first cooperative element coming into engagement with the fourth cooperative element, at substantially the same time that the second cooperative element disengages from the third cooperative element, and moving the fourth cooperative element to return the driving means to the starting position where the fourth cooperative element is still engaged by the first cooperative element to hold the driving means in the starting position,

(p) a release means provided in conjunction with the second depressing element, and

(q) a fifth cooperative element which is moved as the driving means moves and is operatively associated with the release means,

the first cooperative element coming into engagement with the release means, at substantially the same time that the driving means reaches the starting position, to operate the release means to disengage the second depressing element from the push button, thereby switching the tacker off, and

the first cooperative element moving the driving means for a slight distance to the first extreme position, when the trigger is depressed, and then disengaging from the fourth cooperative element to allow the driving means to spring to the second extreme position by the action of the urging means.

5,004,141

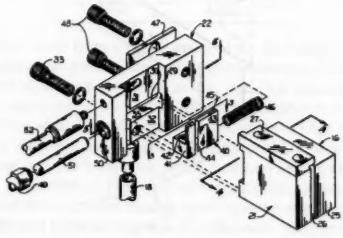
FASTENER FEEDING AND DRIVING APPARATUS

Alfred Young, Hickory, and Fred E. Church, Newton, both of N.C., assignors to Design Tool, Inc., Hickory, N.C.

Continuation-in-part of Ser. No. 260,239, Oct. 20, 1988. This application Jan. 30, 1990, Ser. No. 472,602

Int. Cl.[5] B23P *11/00*; B25C *1/04*

U.S. Cl. 227—112 **18 Claims**



1. An automatic fastener feeding and driving apparatus comprising

a source of pressurized air, and air supply line connected to said source,

fastener supply means including an outlet chute, and vibratory means for serially supplying fasteners along said chute,

fastener feeding means connected to said outlet chute for serially delivering fasteners from said chute to a fastener delivery line, and including a slide mounted for movement between a pick-up position engaging the leading fastener in said chute and a discharge position wherein the engaged fastener is moved into said fastener delivery line,

a fastener driver comprising a housing which includes a forward barrel portion, said barrel portion having a fastener inlet opening which is connected to said fastener delivery line for receiving a fastener into said barrel portion, and a plunger which is mounted for longitudinal movement within said housing so as to be adapted to move forwardly through said barrel portion and drive a fastener which is positioned in said barrel portion into a workpiece,

air valve means operatively connected to said air supply line and to said fastener feeding means, and being selectively movable between a first position wherein said feeding means is moved to its pick-up position, and a second position wherein said feeding means is moved to its discharge position and air is injected into said fastener delivery line from said source of pressurized air to deliver a fastener therein through said inlet opening and into said barrel portion of said driver, and

trigger means mounted on said driver for when closed causing said plunger to rapidly move forwardly through said barrel portion of said driver and causing said air valve means to move to its first position, and when open causing said air valve means to move to said second position and said plunger to return in the rearward direction.

5,004,142

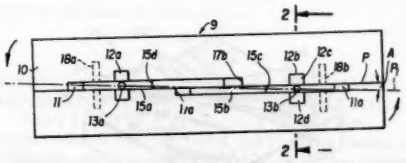
GUIDE ANVIL INCLUDING MOVABLE CLINCHING WINGS FOR STAPLER

Paul Olesen, Bellmore, N.Y., assignor to Swingline Inc., Long Island City, N.Y.

Filed Jan. 23, 1989, Ser. No. 300,510

Int. Cl.[5] B25C *7/00*

U.S. Cl. 227—155 **2 Claims**



1. An anvil unit having a stationary portion and movable portions for guiding and clinching a staple having a crown and two legs including drive means for driving the staple in a vertical plane comprising

a. a stationary anvil portion having side-by-side vertical parallel slots each angled to the vertical plane which slots each in turn include a guide means for guiding each staple leg;

b. a slot end of each slot positioned between the guide means of each slot and such slot ends being spaced apart a distance with each slot connected together over such distance;

c. sloping surfaces on each guide means for guiding the staple leg into a slot;

d. a pivotal clinching anvil wing portion positioned in each of the slots to pivot for engaging and thereafter bending the leg to a clinch position, each of said anvil wing portions adjacent one another during such pivotal movement; and

e. power means for moving the clinching wing portions to clinch the staple legs.

5,004,143

METHOD OF MANUFACTURING CLAD BAR

Kazuyuki Nakasuji, and Chihiro Hayashi, both of Amagasaki, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Jul. 28, 1987, Ser. No. 79,143

Claims priority, application Japan, Jul. 31, 1986, 61-181635; Aug. 8, 1986, 61-187318; Nov. 14, 1986, 61-272580

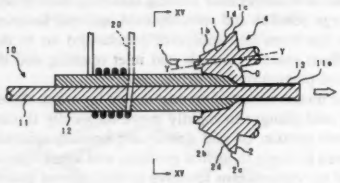
Int. Cl.[5] B23K *20/04*

U.S. Cl. 228—126 **30 Claims**

1. A method of manufacturing a clad bar, in which a colum-

nar core member is fitted in a cylindrical outside layer member having a greater resistance to deformation than the columnar core member to bond them to each other, comprising:

heating an assembly obtained by fitting the core member in the outside layer member; and



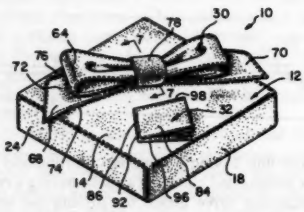
elongating the heated assembly by a rotary mill having three or more cone type rolls to finish the assembly to a desired size with the interface between the core member and the outside layer member being characterized by diffusion bonding.

5,004,144

REUSABLE FABRIC GIT WRAP

Betty J. Selga, 4859 Briercrest Ave., Lakewood, Calif. 90713

Filed Sep. 8, 1989, Ser. No. 404,821
Int. Cl.[5] B65D *65/06*
U.S. Cl. 229—87.190 10 Claims



1. A reusable article for enveloping gifts comprising an expansive quilted fabric wrap having opposite surfaces and having overlock stitches of thread extending about its entire perimeter wherein said surfaces are reversible and when unfolded said wrap is adapted to receive a gift therein and defines a cruciform having two pairs of outwardly directed foldable flaps, the flaps in each pair being directed in mutually opposite directions and the pairs of flaps residing in mutually perpendicular disposition when said flaps are unfolded, and releasable flexible hook and loop fastening means are secured to each of said pairs of flaps of said fabric wrap for holding said fabric wrap shut to encase said gift therewithin with one of said opposite surfaces selectively and alternatively disposed as an outer exposed surface and with the other of said opposite surfaces selectively and alternatively disposed as an inner concealed surface.

5,004,145

CARTON HANDLING DEVICE

E. Ennalls Patterson, 2053 Cressman Rd., Box 605, Skippack, Pa. 19474

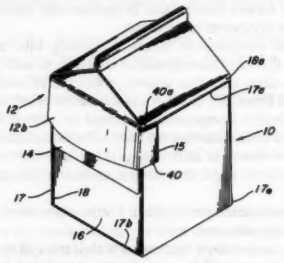
Filed Aug. 15, 1990, Ser. No. 567,616
Int. Cl.[5] B65D *5/46*
U.S. Cl. 229—117.26 10 Claims

1. A biodegradable handling assembly comprising:

(a) a member having side panels and a bottom area for holding dry or, alternatively, liquid measure;

(b) means attached to said member for pouring said dry or liquid measure therefrom;

(c) a handle means horizontally attached and extending across one said side panel of said member; and



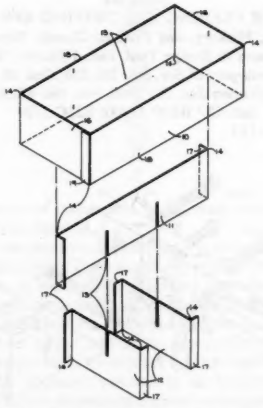
(d) said handle means being formed into a pouch-like opening to accommodate partial insertion of the fingers for ease of transporting from place to place and for pouring from said member.

5,004,146

PORTABLE, COLLAPSIBLE CELLULAR RACK

Maurice Thominet, and Rosemarie Thominet, both of 704 Crane Blvd., Libertyville, Ill. 60048

Filed Aug. 17, 1989, Ser. No. 395,355
Int. Cl.[5] B65D *5/48*
U.S. Cl. 229—120.31 3 Claims



1. A portable collapsible cellular rack for use and storage within an automobile trunk having an operative erect condition exposing cells sized to hold one grocery bag within each of said cells in an upright position against movement during transit, said rack fabricated of corrugated fiberboard strip stock, comprising a pair of Z shaped cross partitions having fold lines for hinging near each end, and having a medial oversized slot in said cross partitions for engaging a Z shaped middle partition also having fold lines for hinging near each end, and having appropriately located oversized slots for interlocking with said medial slot of each said cross partition, and each said cross partition and said middle partition having each hinged end permanently attached at guide marks on a rectangular strip having four folded corners for hinging, and having a folded end for interconnection forming a perimeter of two short and two long side panels, to thereby form said open cells within the area bounded by said perimeter and occupied said partitions for upright transit of grocery bags, whereby following said operative erect condition, said rack is quickly closed

by turning on either one of said long side panels of the perimeter and collapsing in an accordion manner for relatively flat stowing in said automobile trunk so as to be readily available for convenient use by reversing said described procedure for closing, all without the need for any tools, added parts, or hardware.

5,004,147

PACK MADE FROM BOARD

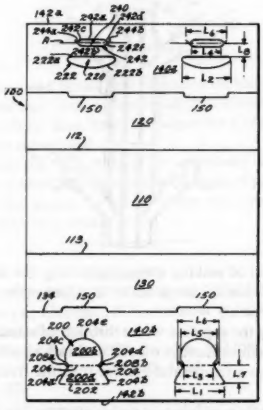
Patrick Bienaime, Troissereux, France, assignor to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Filed Sep. 21, 1989, Ser. No. 410,625

Claims priority, application France, Oct. 27, 1988, 88 14032

Int. Cl.[5] B65D *5/42*

U.S. Cl. 229—198.2 **10 Claims**



1. A pack made from a board material for packaging one or more objects, said pack comprising a blank having a first panel which will serve as a top panel in use, said first panel having opposite edges and a side panel hingedly connected to each said opposite edge, said side panels each having an edge spaced from said hinged connection to said first panel, a base panel comprising two portions, each of said portions having an edge hingedly connected to said spaced edge of one of said side panels, said two portions having interengaging means for securing said two portions together to define said base panel, said interengaging means comprising on one of said portions a pair of tabs formed by die-cutting into said one portion with said tabs being hingedly connected to said one portion by respective first folding lines, each said portion having a free edge with said first folding lines extending parallel to said free edge of said respective portion of said base panel, each said tab having a second folding line which extends parallel to said first folding line with said second folding line defining a section of each tab having projections extending from said section, said tab having a body portion disposed between said folding lines thereof with said body portion having the shape of a trapezoid which tapers from said first folding line to said second folding line so that the length of the second folding line is less than the length of said first folding line, the free end of the tab having a convex circular section having opposite ends connected to said second fold line each by straight edges with said straight edges extending divergingly from said second folding line, said other portion of said base panel including openings each for receiving a said tab.

5,004,148

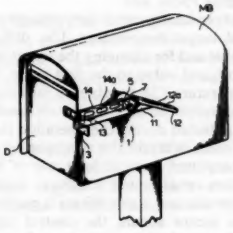
AUTOMATIC FLAG FOR RURAL MAILBOX

Ron Windrem, R.R. #5, Lindsay, Ontario, Canada K9V 4R5

Filed Apr. 12, 1990, Ser. No. 507,778

Int. Cl.[5] B65D *91/00*

U.S. Cl. 232—35 **3 Claims**



1. A mailbox with an automatic mailbox flag comprising an elongated arm of at least substantially uniform weight distribution from end to end of said arm, said arm being provided with a mounting opening off-center of said arm thereby providing a short arm end and a long arm end and said short arm end being bent to provide a flag portion on said arm, and both said long end and said short end of said arm being provided with reflectors, the reflector on said long end of said arm being visible from the side of said mail box, the reflector on said short end of said arm being mounted on said flag portion and being visible from the front of said mailbox.

5,004,149

CENTRAL AIR CONDITIONING SYSTEM HAVING COMPENSATING CONTROL FUNCTION FOR TOTAL HEAT LOAD IN A PLURALITY OF ROOMS

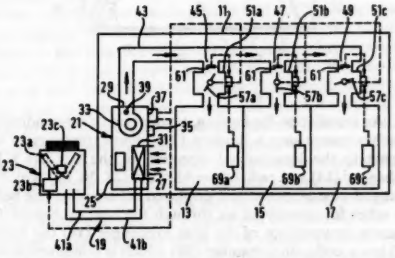
Hidetoshi Narikiyo; Yukifumi Gotou, and Yoshihiro Chuma, all of Shizuoka, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Nov. 8, 1989, Ser. No. 433,654

Claims priority, application Japan, Jan. 24, 1989, 1-14602; Jan. 24, 1989, 1-14603

Int. Cl.[5] F24F *7/00*

U.S. Cl. 236—49.3 **10 Claims**



2. A central air conditioning system wherein conditioned air is channeled through a main duct to a plurality of rooms to be air-conditioned, the system comprising:

air conditioning means for generating conditioned air at a target temperature Tfs having an original value and for forcibly supplying the conditioned air to the main duct;

air volume control means having a damper, corresponding to each room, for regulating the amount of the conditioned air from the main duct to the corresponding room, the air volume control means including air volume sensor means for detecting the amount of the conditioned air fed through the damper, the air volume sensor means outputting a maximum air amount signal Sfmax when the maxi-

mum amount of the conditioned air through the damper is detected, the air volume sensor means also outputting a minimum air amount signal Sfmin when the minimum amount of the conditioned air through the damper is detected;

room temperature sensor means, corresponding to each room, for detecting an actual room temperature Ta of the corresponding room; and

control signal producing means for producing a first value of a modified target temperature Tfm different from the original value and for changing the target temperature Tfs from the original value to the first value of the modified target temperature Tfm to establish the target temperature Tfs of the conditioned air from the air conditioning means when it is detected during the operation that either a first condition exists wherein the minimum air amount signal Sfmin is outputted from at least one of the air volume sensor means or a second condition exists wherein the maximum air amount signal Sfmax is outputted from each air volume sensor means, the control signal producing means further producing successive values of the modified target temperature Tfm and changing the target temperature Tfs to successive values of the modified target temperature Tfm until the actual room temperature Ta in each room reaches the corresponding desired room temperature Ts.

5,004,150

INSTALLATION FOR HEATING, VENTILATION OR AIR-CONDITIONING OF A LONG-DISTANCE BUS

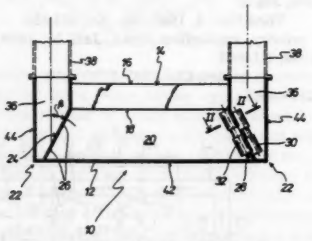
Juergen Koehler, Spiegelslustweg, Fed. Rep. of Germany, assignor to Konvekta GmbH, Schwalmstadt, Fed. Rep. of Germany

Filed Feb. 20, 1990, Ser. No. 482,334

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1989, 3907051; Apr. 8, 1989, 3911515

Int. Cl.[5] B60H *1/02*

U.S. Cl. 237—12.3 A **7 Claims**



1. An installation for heating, ventilation or air-conditioning of a bus comprising a housing (12) which transversely with respect to the longitudinal direction of the bus has a heat exchanger (14) and radial-flow blowers (28, 30, 32) which are arranged in superposed and displaced relationship one behind the other for conveying air through the heat exchanger (14), wherein downstream of the heat exchanger (14) the housing (12) has a collecting chamber (20) which is communicated by way of two lateral corner regions (22) with longitudinal ducts (36) to which are connected roof ducts (38) which extend in the longitudinal direction of the bus, characterised in that the radial blowers (28, 30, 32) are arranged in the form of suction blowers in two groups which are spatially separated from each other downstream of the heat exchanger (14), wherein the blowers (28, 30, 32) of each group of blowers are arranged with their outlet openings (34) at respective openings (26) through an associated partitioning wall (24) which extends over the respective corner region (22) between the housing (12) and the heat exchanger (14) and separates the collecting chamber (20) from the associated longitudinal duct (36), and that the partitioning walls (24) with the blowers (28, 30, 32) disposed on the openings (26) therethrough are inclined through an angle α relative to the horizontal and are inclined through an acute angle β relative to the longitudinal direction in regard to their orientation (40) between the collecting chamber (20) and the two lateral longitudinal ducts (36).

5,004,151

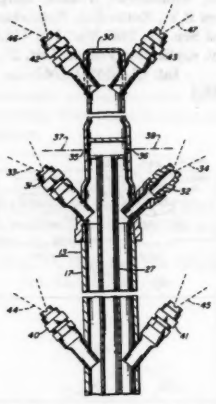
METHOD AND APPARATUS FOR MAKING SNOW

Herman K. Dupre, c/o Seven Springs, Champion, Pa. 15622

Filed Nov. 20, 1989, Ser. No. 438,615

Int. Cl.[5] F25C *3/04*

U.S. Cl. 239—2.2 **24 Claims**



1. A method of making snow comprising the steps of:

supplying water under pressure to a first point of discharge above ground;

discharging the supplied water through a first nozzle into the ambient atmosphere in the form of a spray when the atmosphere has a temperature lower than the freezing point of water;

independently supplying air under pressure to a second point of discharge above ground;

discharging the supplied air under pressure into ambient atmosphere in the form of a jet steam directed into the throat of said sprayed water thereby forming a plume of atomized water to produce snow; and

discharging the supplied water through at least one additional nozzle positioned adjacent to said first nozzle into the ambient atmosphere in the form of an additional spray directed into said plume.

5,004,152

ACOUSTIC MONITORING OF TWO PHASE FEED NOZZLES

Charles L. Baker, Thornton, Pa.; George D. Cody, Princeton, N.J.; Craig A. Joseph, Martinez, and Uri Sela, Walnut Creek, both of Calif., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Oct. 30, 1989, Ser. No. 428,553

The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.

Int. Cl.[5] G01H *3/00*

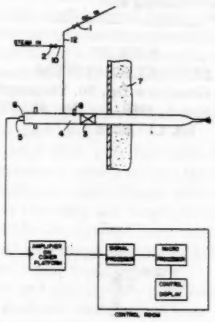
U.S. Cl. 239—8 **6 Claims**

1. A passive acoustic nozzle monitoring process for correcting the operating conditions of a feed nozzle injecting a liquid gas mixture into a process vessel or chamber so as to maintain the correct mixing of said liquid and gas exiting the nozzle comprising:

(a) determining an initial time variation of the vibrational signal over an initial time period from a vibrational sensor

in close proximity to said nozzle when said nozzle is performing at a standard mixing or flow condition which is the desired operating state of the nozzle;

(b) determining a time variation of the vibrational signal over a later time period from said vibrational sensor in close proximity to said nozzle;



(c) comparing said initial time variation of said vibrational signal with said time variation of said vibrational signal taken at a later time, so as to determine a change in said vibrational signal; and

(d) correcting the flow state of the nozzle by changing the variables controlling the relative volumes of gas and liquid entering the nozzle so as to return said nozzle to said desired operating state.

5,004,153

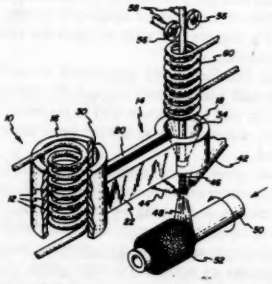
MELT SYSTEM FOR SPRAY-FORMING

Thomas F. Sawyer, Charlton, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 2, 1990, Ser. No. 487,095

Int. Cl.[5] B05O *1/24*

U.S. Cl. 239—81 **5 Claims**



1. Apparatus for forming a continuous liquid metal melt stream of closely defined lateral dimensions which comprises,

a source of liquid metal,

means for directing said metal in a stream to a magnetic nozzle to permit said nozzle to act on said stream,

a primary induction coil having a multiplicity of helical windings,

a secondary induction coil having a single winding,

said secondary induction coil being in the form of two connected sleeves,

the first of said sleeves being larger in height and diameter and surrounding the primary induction coil,

the second of said sleeves being smaller in height and diameter and being spaced from the first sleeve,

each of said sleeves having an axially aligned slit in the portion of the wall surface thereof facing the other sleeve,

said sleeves being connected by a pair of side by side parallel strip conductors having a height approximating that of the second sleeve,

and said second sleeve having an internal conical surface terminating in an opening slightly larger than that of the desired diameter of the stream of metal to pass therethrough,

whereby a high density flux is developed along the axis of the second sleeve to cause said second sleeve to serve as a magnetic funnel and to to control the dimensions of a liquid metal stream passing therethrough.

5,004,154

HIGH PRESSURE FUEL INJECTION DEVICE FOR ENGINE

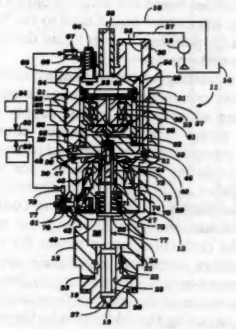
Takeo Yoshida, and Hajime Kishida, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Oct. 16, 1989, Ser. No. 422,031

Claims priority, application Japan, Oct. 17, 1988, 63-259563; Feb. 20, 1989, 1-39650

Int. Cl.[5] F02M *47/02*

U.S. Cl. 239—96 **14 Claims**



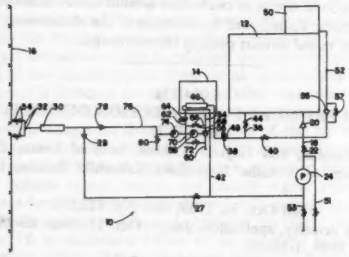
1. An accumulator type of injection nozzle comprised of an accumulator chamber supplied with high pressure fuel from a fuel inlet, a nozzle port leading from said accumulator chamber, an injector valve means for moving said injector valve in response to fuel pressure relative to said nozzle port between a closed position and an open position for controlling the discharge of fuel from said accumulator chamber through said nozzle port, said means for moving said injector valve in response to fuel pressure comprising a control chamber for receiving pressurized fuel from said fuel inlet, said control chamber having a relief passage, an actuating member supported for movement within said control chamber and associated with said injector valve for retaining said injector valve in its closed position when said control chamber is pressurized and for movement of said injector valve to its opened position when pressure is relieved in said control chamber, and relief valve means moveable between a closed position for closing said relief passage and maintaining pressure in said control chamber and an opened position for opening said relief passage and relieving said control chamber pressure for effecting fuel discharge through said nozzle port and actuating means associated with said relief valve means for urging said relief valve means to one of its positions when said actuating means is energized, and variable stop means associated with said injector valve for varying the open position of said injector valve to either of at least two selected positions relative to said nozzle port for controlling the amount of fuel discharged by said injector valve.

5,004,155

AGRICULTURAL SPRAYER

Norm Dashevsky, General Delivery, Brunkild, Manitoba, Canada R0G 0E0

Filed Jan. 30, 1990, Ser. No. 472,283
Int. Cl.[5] B05B 9/00
U.S. Cl. 239—127 4 Claims



1. A system for supplying measured quantities of fluid additive to a carrier liquid flow in an agricultural sprayer of the type having a carrier liquid tank, a spray boom assembly for spraying mixed carrier liquid and additive onto a field, a supply line leading from the carrier liquid tank to the boom and carrier pump means for pumping carrier liquid through the supply line, said system comprising:

an additive circulating circuit including circulating pump means, means connected to the circulating pump means for supplying additive from a bulk supply thereof to the circulating pump means, and means connected to the circulating pump means for receiving pressurized additive from the circulating pump means and for returning pressurized additive to the bulk supply thereof;

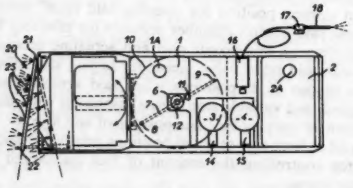
an additive metering and injecting circuit comprising metering pump means, means connecting the metering pump means to the circulating pump means for receiving pressurized additive therefrom and means connected to the metering pump means and the supply line for receiving metered quantities of the additive from the metering pump means and injecting the additive into the supply line.

5,004,156

WASHING DEVICE MOUNTED ON A MOTOR VEHICLE AND COMPRISING A ROTARY WASHING ARM WHICH DELIVERS JETS OF PRESSURIZED HOT WATER FOR CLEANING VARIOUS SURFACES

Gérard Montanier, 24 Boulevard Emile-Genevoix, 93230 Romainville, France

PCT No. PCT/FR88/00501, § 371 Date Jun. 9, 1989, § 102(e) Date Jun. 9, 1989, PCT Pub. No. WO89/03456, PCT Pub. Date Apr. 20, 1989
PCT Filed Oct. 10, 1988, Ser. No. 368,300
Claims priority, application France, Oct. 9, 1987, 87 13956
Int. Cl.[5] B05B 1/24; E01H 1/10
U.S. Cl. 239—130 25 Claims



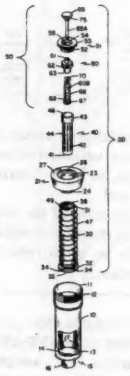
1. A washing device mounted on a motor vehicle comprising at least one cold water tank, means carrying water from said at least one cold water tank to means for heating, said means for heating comprising a high-pressure boiler adapted to deliver hot water at a pressure of 100 to 250 bars, means for supplying the pressurized hot water to a rotary cleaning arm fitted with at least one nozzle capable of directing a jet of pressurized hot water to a surface to be cleaned, and a protective casing surrounding said rotary cleaning arm.

5,004,157

SPRINKLER SYSTEM

Ely A. Martell, 60 Grandview Dr., So. Yarmough, Mass. 02341

Filed Sep. 5, 1989, Ser. No. 402,518
Int. Cl.[5] B05B 15/10
U.S. Cl. 239—205 6 Claims



1. A sprinkler unit with a preset spray pattern for use in an underground sprinkler system, comprising:

a base mount having a substantially vertical cylindrical shape and internally formed into a cylindrical well having a plurality of longitudinal lands and having an open top end and a bottom end with an inlet for receiving water under pressure; and

a sprinkler head assembly positioned in said base mount through said base mount's top end for vertical movement relative to said base mount and in response to said water pressure, wherein the sprinkler head assembly is comprised of:

a hollow, generally cylindrical main shaft with a top end and a bottom end concentrically positioned within said base mount and having an internal radial flange with a central opening, wherein said main shaft bottom end terminates in an outwardly extending radial flange with a plurality of notches corresponding to and cooperatively engaging the internal base mount lands, whereby said main shaft may be installed within said base mount in only one position;

an outer cap with a central opening radially positioned about said main shaft and removably attached to said base mount, wherein said central opening contains a radial groove into which a resilient O-ring seal is positioned thereby preventing dirt and grime from entering and water from escaping between the main shaft and outer cap;

a spring, having a top and a bottom, positioned about said main shaft and inside said base mount, wherein said spring bottom rests on said main shaft base mount bottom flange and said spring top abuts against said outer cap, and normally acts to retract said sprinkler head

assembly with a force smaller that exertible by said water pressure;

an elongated, generally cylindrical filter concentrically positioned within said main shaft and having an upper portion, lower portion, and closed bottom, said upper portion having a diameter greater than the diameter of the main shaft internal flange central opening and said lower portion having a diameter less than the diameter of the main shaft internal flange central opening, and said lower portion having a plurality of narrow longitudinal slots along most of its length; and

a nozzle assembly removably attached to said main shaft comprised of:

an inner cap with a central opening removably attached to said main shaft;

a spray head shaft with two ends, one end of which terminates in a spray head and the other end of which terminates in a radial flange, wherein said spray head shaft is vertically and longitudinally positioned concentrically through said inner cap central opening for vertical movement relative to said inner cap in response to said water pressure;

an orifice unit concetrically positioned about said spray head shaft and abutting said inner cap; and

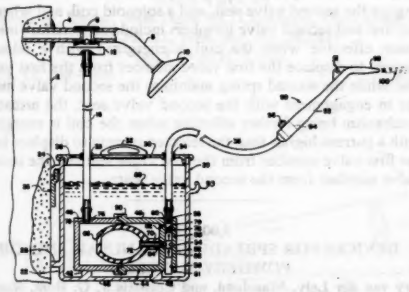
a spring with two ends positioned about said spray head, one end of which rests on said radial flange and the other end of which abuts against said orifice unit, and normally acting to retract said spray head shaft into said inner cap with a force smaller that exertible by said water pressure.

5,004,158

FLUID DISPENSING AND MIXING DEVICE

Stephen Halem, 47 Sargent St., and Philip R. Lichtman, 3 Valley Spring Rd., both of Newton, Mass. 02158

Filed Aug. 21, 1989, Ser. No. 396,520
Int. Cl.[5] B05B *7/32*
U.S. Cl. 239—310 **26 Claims**



1. A device for dispensing a predetermined quantity of a selected additive in liquid form and mixing it with a selected diluting liquid comprising:

a container for holding a supply of said selected additive;

a positive displacement pump comprising a vessel, displacement means within said vessel subdividing the interior of said vessel into a first variable volume additive-containing compartment and a second variable volume diluting liquid-containing compartment, a first port for admitting said additive to said first compartment, a second part for admitting said diluting liquid to said second compartment, first means including an inlet passageway communicating with the interior of said container and a first check valve for conveying additive from said container into said first compartment via said first port, second means including a discharge passageway and a second check valve for conveying additive out of said first compartment via said first port;

means for conveying said diluting liquid from a supply line into said second compartment via said second port; and

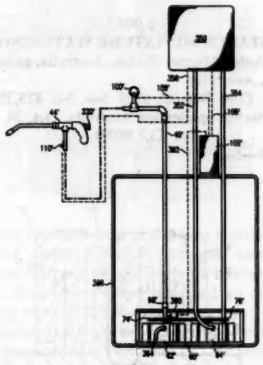
means for admixing said diluting liquid with said additive as said additive is discharged from said first compartment via said first port, said second check valve, and said discharge passageway.

5,004,159

METHOD AND APPARATUS FOR APPLYING SINGLE OF MULTICOMPONENT MATERIALS

Kenneth J. Kistner, Midlothian, Tex., assignor to Specified Equipment Systems Company, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 147,880, Jan. 25, 1988. This application Jan. 17, 1989, Ser. No. 296,734
Int. Cl.[5] B05B *7/24, 7/16*
U.S. Cl. 239—337 **7 Claims**



1. A system for pumping a fluid comprising:

a gear pump having two or more gears operating in a gear housing for receiving and pumping said fluid,

a discharge line from said pump for receiving said pumped fluid,

a dispenser connected on said line for selectively discharging fluid pumped through said line when said dispenser is in its opened position, and

a torque motor for driving said gear pump,

a closed chamber substantially enclosing said gear pump and said torque motor containing pressurized noncompressible fluid, said chamber being fully submerged within the fluid being pumped.

5,004,160

ATTACHMENT SYSTEM FOR LIQUID SPRAY LANCE

Robert C. Berfield, Jersey Shore, Pa., assignor to Shop-Vac Corporation, Williamsport, Pa.

Filed Mar. 16, 1990, Ser. No. 494,751
Int. Cl.[5] B05B *15/06*
U.S. Cl. 239—525 **8 Claims**

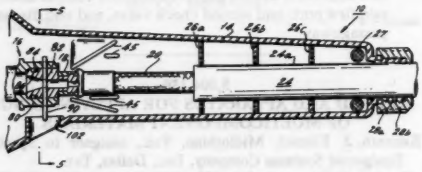
1. An attachment system for a liquid spraying lance, comprising:

a pump housing containing a pump outlet coupling that vibrates along with the housing when a pump operates;

a spray lance attachable to the housing at a location spaced from the pump outlet coupling, the lance having a liquid inlet coupling for flow communication with the pump outlet coupling;

a sleeve having first and second end portions respectively anchored to the housing and to the lance and selectively detachable from each of them;

a hose extending through the sleeve, the hose having an intermediate portion; at opposite ends of the hose, a hose inlet coupling and spaced from it a hose outlet coupling are provided for respective detachable connection to the pump outlet coupling and to the lance inlet coupling;



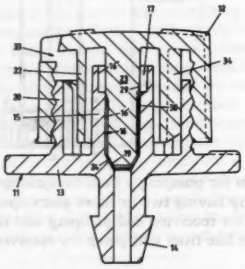
the sleeve being rigid relative to the intermediate portion of the hose while the intermediate portion of the hose being sufficiently flexible and unrestrained as to substantially insulate the housing and the pump outlet coupling from transferring vibration to the lance inlet coupling.

5,004,161

ADJUSTABLE MINIATURE WATERING DEVICE

William E. Antel, Murray Bridge, Australia, assignor to Antelco Pty. Ltd., Australia

Filed Oct. 23, 1989, Ser. No. 425,795
Claims priority, application Australia, Oct. 24, 1988, PH1124
Int. Cl.[5] B05B *15/00*
U.S. Cl. 239—542 **6 Claims**



1. An improved miniature watering unit comprising:

a generally cylindrical body having first walls forming a central axial bore extending therethrough and second walls defining an annular chamber surrounding said first walls and coaxially therewith, said bore having a lower small diameter bore portion and an upper large diameter bore portion;

inlet means communicating with said small diameter bore portion for attachment to a source of pressurized water;

at least one water outlet opening communicating with said large diameter bore portion;

a rotatable cap threadably mounted on said body and having

a centrally located stem depending from the top wall of said cap disposed to insertingly engage coaxially with said bore and

a generally cylindrical outer peripheral skirt and an inner peripheral skirt spaced radially from said outer skirt, each said skirt depending from the top wall of said cap,

said stem having an upper sealing engagement surface intermediate to its ends disposed to engage in sealing relationship with the upper end of said small diameter bore portion, and a reduced thickness section extending between said engagement surface and the lower end of said stem, being shaped and dimensioned such that an arcuate orifice of variable circumferential width is formed between said stem and the upper edge of said small diameter bore portion as said cap is rotated relative to said body to raise or lower said stem within said bore, whereby the adjustment in width of said orifice in turn adjusts the rate of water flow from said unit, and

said inner skirt projecting into said annular chamber and dividing it axially such that water exiting from the open upper end of said bore follows an elongated flow path prior to its discharge through outlet orifices formed around the upper periphery of said cap; and

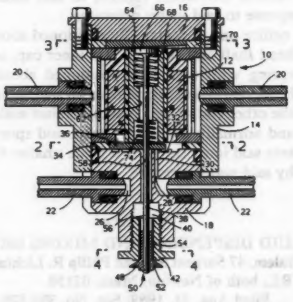
ratchet means co-operable between said cap and said body arranged to provide a step-by-step rotational adjustment of said cap with respect to said body.

5,004,162

SOLENOID ACTUATED VALVE ASSEMBLY

Ernest R. Stettner, Spencerport, and Donald D. Stoltman, Henrietta, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 21, 1989, Ser. No. 369,506
Int. Cl.[5] F02M *61/04*
U.S. Cl. 239—585 **9 Claims**



1. A solenoid actuated valve assembly comprising first and second valve members, first and second valve seats, a first spring biasing the first valve member to engage the first valve seat, a second spring biasing the second valve member to engage the second valve seat, and a solenoid coil, and wherein the first and second valve members include an armature mechanism effective when the coil is energized with a selected current to displace the first valve member from the first valve seat while the second spring maintains the second valve member in engagement with the second valve seat, the armature mechanism being further effective when the coil is energized with a current higher than the selected current to displace both the first valve member from the first valve seat and the second valve member from the second valve seat.

5,004,163

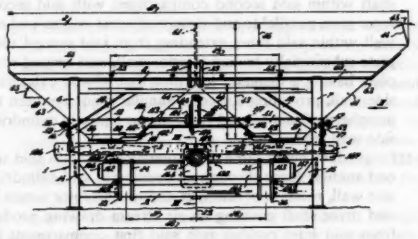
DEVICES FOR SPREADING GRANULAR AND/OR POWDERY MATERIAL

Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands

Filed Oct. 30, 1979, Ser. No. 89,755
Claims priority, application Netherlands, Oct. 31, 1978, 7810805
Int. Cl.[5] A01C *17/00*
U.S. Cl. 239—661 **106 Claims**

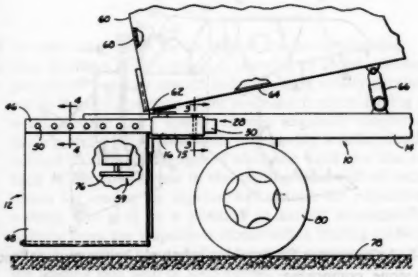
1. A device for spreading granular and powdery materials comprising a frame which includes means so constructed and arranged to connect to a three-point lifting device of a tractor, a hopper for the material to be spread which is carried by said frame and at least two rotatable distributing means drivable in opposite rotational directions about upwardly extending rotary axes, characterized in that when portions of said distribution means are moving nearest each other they are moving generally in the direction of said connection means for a tractor's

three-point lifting device, said hopper having two side-by-side funnel-shaped parts, feeding means being provided at the bottom of each said funnel-shaped part for performing the function of feeding material from said hopper to each said distributing means, each said distributing means receiving material from said feeding means eccentrically with respect to its corresponding said rotary axis and comprising at least one ejection means performing the function of spreading the material so received within a predetermined sector which extends over substantially equal distances on either side of a vertical plane passing through the center of the device parallel to its intended direction of operative travel and away from said connection



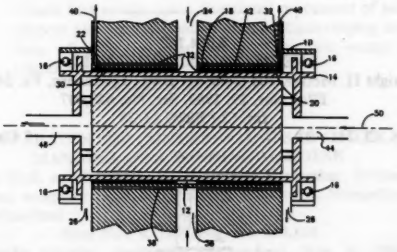
means for a tractor's three-point lifting device; said ejection means of one said distributing means being angularly offset with respect to said ejection means of the other said distributing means so that material is ejected in an alternating sequence from said distributing means, said distributing means being driven in a manner cooperating with the disposition of said feeding means and so constructed and arranged that in operation each of said distributing means performs the function of spreading material across said sector relative to its corresponding said rotary axis which coincides throughout its greater extent with the sector across which the other said distributing means spreads material.

5,004,164
SALT TRUCK
George W. Ruane, 5660 Delhi Rd., Cincinnati, Ohio 45238
Filed Jul. 21, 1989, Ser. No. 383,917
Int. Cl.[5] A01C *17/00*
U.S. Cl. 239—666 **5 Claims**



1. The combination of a truck including a bed, a salt bin mounted on the bed, there being a discharge opening in the bin, and a salt distributing spinner device mounted on the bed and receiving salt from the discharge opening, the spinner device distributing salt circumferentially of the spinner device with a guide support mounted on the bed, the guide support having an elongated opening having an axis extending lengthwise of the direction of advance of the truck, a staff mounted in the opening in the guide support and extending longitudinally in the direction of the axis of the opening with an end portion of the staff extending cantileverwise from the guide support in opposed relation to the salt distributing device, and a guide member having a flexible rubberlike panel attached to the end portion of the staff and extending downwardly from the staff into the path of salt projected sidewise of the direction of truck advance to catch and stop travel beyond the side line of the truck of the salt sidewise of the direction of truck advance.

5,004,165
DISPERSION APPARATUS
Benzion Landa, Edmonton, Canada; Haim Hochman, Ramat Gan, and Naseem Yacoub, Herzelia, both of Israel, assignors to Spectrum Sciences B.V., Wassenaar, Netherlands
Continuation-in-part of Ser. No. 306,077, Feb. 6, 1989, abandoned. This application Aug. 30, 1989, Ser. No. 400,721
Int. Cl.[5] B02C *17/16*
U.S. Cl. 241—21 **30 Claims**



1. Apparatus for dispersion of solids in liquids comprising:

(a) first and second relatively movable elements having respective first and second surfaces having a separation distance therebetween and arranged so as to define a dispersing volume therebetween;

(b) a multiplicity of separate dispersing elements disposed within the dispersing volume, said dispersing elements having a cross-section that is circular in shape and having a diameter which is between 2 and 100 microns less than said separation distance;

(c) means for supplying a solid suspended in liquid to the dispersing volume and for removing a dispersed form of said solid suspended in liquid from the dispersing volume after dispersing; and

(d) means for effecting relative movement between said first and second surfaces whereby movement is imparted to said dispersing elements mainly by means of hydrodynamic forces created by said relative movement, thereby subjecting the solids to high shear forces operative to break up and disperse said solid in said liquid.

5,004,166
APPARATUS FOR EMPLOYING DESTRUCTIVE RESONANCE
John G. Sellar, 6045 E. Evans Pl., Lakewood, Colo. 80227
Filed Sep. 8, 1989, Ser. No. 405,000
Int. Cl.[5] B02C *19/18*
U.S. Cl. 241—36 **4 Claims**

1. An apparatus for fracturing a mass of material such as rock, using resonant frequencies wherein, the apparatus comprises:

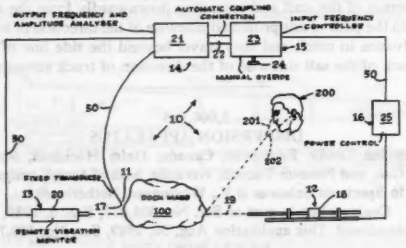
means for determining the resonant frequency for a given mass of material:

non-contacting sub-ultrasonic frequency generating means for generating frequencies in the sub-ultrasonic range;

means for monitoring changes in the resonant frequency of the mass of material as fracturing takes place;

energy generating means; and, control means operatively associated with the means for monitoring or the non-con-

tacting frequency generating means for varying the output of the energy generating means in response to the input of



the means for monitoring changes in the resonant frequency of the mass such that fracturing of the mass of material will continue.

5,004,167

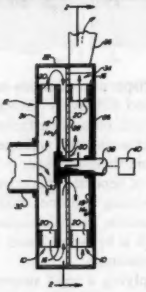
PNEUMATIC GRINDING MILL

Dwight H. McGee, 304 Oakridge Blvd., Lynchburg, Va. 24502

Filed Nov. 29, 1989, Ser. No. 429,007

Int. Cl.[5] B02C *13/28*

U.S. Cl. 241—91 **5 Claims**



1. Multi-stage milling apparatus for reducing the size of grain kernels and particles comprising:

(a) substantially cylindrical housing means including first and second, flat, circular end walls joined by a cylindrical side wall, and a flat, circular interior wall, parallel to and between said first and second end walls dividing the interior of said housing means into first and second, side-by-side compartments;

(b) first and second rotor means respectively positioned within said first and second compartments, each of said rotor means including a single, flat, circular plate and a plurality of open-ended metal tubes of rectangular cross section having a surface perpendicular to said rigid surface in contact with said one side of said rotor plates, said tubes being fixedly attached to and supported solely by one side of said plate in closely spaced relation about the periphery thereof, each of said tubes having a rigid surface substantially perpendicular to said one side of said plate;

(c) a product inlet conduit connected to said first end wall and communicating with said first compartment through an opening in and concentric about the central axis of said first end wall;

(d) a drive shaft connected to rotary drive means and extending through openings in and concentric about the central axis of each of said second end wall, said second rotor plate, and said interior wall, said drive shaft being fixedly connected to both said first and second rotor plates, said second end wall and second rotor plate openings being substantially the same diameter as said drive shaft and said interior wall opening being substantially larger than the diameter of said drive shaft, whereby said first and second compartments communicate through said interior wall opening;

(e) said first rotor means being supported by said drive shaft within said first compartment with said first rotor plate parallel to and spaced from both said first end wall and said interior wall with said tubes extending from said first rotor plate substantially to said first end wall, said first rotor plate having a diameter less than that of said cylindrical side wall, providing a first annular space between the periphery of said first rotor means and said cylindrical side wall;

(f) said second rotor means being supported by said drive shaft within said second compartment with said second rotor plate parallel to and closely adjacent said second end wall within said tubes extending from said second rotor plate substantially to said interior wall, said second rotor plate having a diameter less than that of said cylindrical side wall, providing a second annular space between the periphery of said second rotor means and said cylindrical side wall; and

(g) a product outlet conduit communicating with said second annular space through an opening in said cylindrical side wall, rotation of said first and second rotor means by said drive shaft creating an air stream drawing product from said inlet conduit into said first compartment for impact with said first rotor plate and radially outward movement for impact with said perpendicular surface of said first rotor tubes, into said first annular space, through the space between said first rotor plate and said interior wall, through said interior wall opening into said second compartment for impact with said second rotor plate and radially outward movement for impact with said perpendicular surface of said second rotor tubes, into said second annular space and thence into and through said outlet conduit.

5,004,168

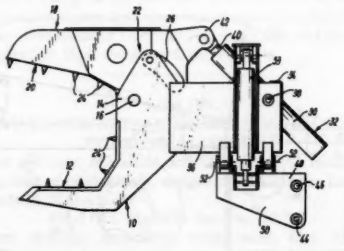
CRUSHING APPARATUS

Brian Purser, c/o The Dudley Shearing Machine Manufacturing Co. Ltd., Nevada Lane, Hot Lane Industrial Estate, Burslem, Stoke-on-Trent, Great Britain ST6 2BY

Filed Nov. 13, 1989, Ser. No. 435,339

Int. Cl.[5] B02C *1/10*

U.S. Cl. 241—101.7 **12 Claims**



1. An apparatus for breaking relatively brittle material such as stone, comprising:

(a) a first jaw having a material engaging surface and a free end;

(b) a second jaw having first and second relatively angled material supporting surfaces and a free end on said first material supporting surface;

(c) mounting means for stationarily mounting the second jaw in a fixed position on a supporting structure;

(d) connecting means for pivotally connecting said first jaw to said stationary second jaw in opposing relation adjacent

an end opposite the respective free ends for pivotal movement of said first jaw relative to said stationary second jaw between:

(1) a relatively open material receiving position wherein the respective free ends of said first and second jaws are each widely spaced-apart to define a material entry plane between the jaws and to receive a quantity of material to be broken, the first material supporting surface of said second jaw residing generally perpendicular to the material entry plane and the second material supporting surface of said second jaw residing generally parallel to the material entry plane to collectively define a large material accommodating space within the first and second jaws; and

(2) a relatively closed material breaking position wherein the free ends of said first and second jaws are closely adjacent to or abutting each other at an angle to force the material into the space between the jaws, and said engaging and supporting surfaces of the first and second jaws oppose each other in spaced-apart relation to define between them a relatively large dimension material holding space to prevent reduction of the breaking action by entrapment of material particles between the first and second jaws; and

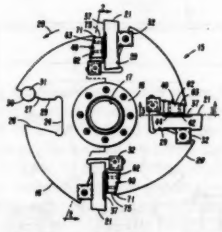
(e) powered means for accomplishing movement of said pivoting first jaw to and from said stationary second jaw.

5,004,169

IMPELLER BAR ASSEMBLY WITH ADJUSTABLE LOCKING MECHANISM

David A. Ostergaard, Cedar Rapids, Iowa, assignor to Cedarapids, Inc., Cedar Rapids, Iowa

Filed Nov. 22, 1989, Ser. No. 440,597
Int. Cl.[5] B02C *13/28*
U.S. Cl. 241—192 **13 Claims**



1. A rotor assemblage for an impact crusher comprising

a rotor having a body portion, a plurality of radial recesses peripherally evenly spaced and extending axially parallel across the body portion of the rotor, each recess having a width defined by a space between angularly displaced leading and trailing side walls and having a radial depth defined by the radial length of such side walls to a base of such recess, and means in the trailing side wall of each recess for seating an impeller bar against the respective trailing side wall in a position to extend substantially radially from the respective recess with a leading surface of such impeller bar radially outwardly converging with the leading side wall of such recess,

a plurality of impeller bars, each having at least one seat complementary with the seating means in the trailing side walls of the recesses within the rotor and adapted to become located within one of the recesses to extend substantially radially therefrom with the leading surface of the impeller bar converging radially outwardly with the respectively adjacent leading side wall of the recess, and

means for locking each of the impeller bars in position against the seating means, the locking means including at least one first wedge of mean width operable in each respective one of the recesses and engageable between a respective one of the impeller bars and the leading side wall of the recess, and comprising the improvement of:

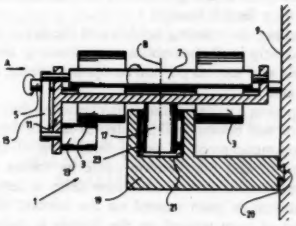
said first wedge including a first body portion having a leading surface engageable with the leading side wall of the respective recess and a converging surface disposed opposite said leading surface, a support plate disposed adjacent the converging surface of said first wedge and having a trailing surface facing and engageable with the respective impeller bar, means for supporting directional movement of said support plate with respect to said first body portion of said first wedge when the wedge is not in wedging engagement between said leading side wall of the recess and the impeller bar, said directional movement maintaining said support plate parallel to said converging surface of said first wedge, and at least one of a plurality of shims of predetermined thickness selectively insertible in and removable from between said converging surface and said support plate of said first wedge upon directional movement of said support plate out of contact with said converging surface, whereby the mean width of the first wedge is selectively adjustable.

5,004,170

APPARATUS FOR COMPENSATING SAG OF THE MANDREL OF A WINDING MACHINE

Felix Graf, and Peter Busenhart, both of Winterthur, Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Nov. 1, 1989, Ser. No. 430,164
Claims priority, application Switzerland, Nov. 4, 1988, 4103/88; Jun. 2, 1989, 02079/89
Int. Cl.[5] B65H *54/02, 54/42*
U.S. Cl. 242—18 R **5 Claims**



1. A yarn winding machine comprising

a rotatable mandrel for receiving a sleeve onto which the yarn may be wound during rotation of the mandrel to build up a yarn package, said mandrel being supported so as to provide a free end thereof onto which sleeves may be inserted and removed axially of the mandrel;

a contact roll generally parallel to said mandrel for pressing against the yarn package being built up during rotation of said mandrel;

mounting means for rotatably mounting said contact roll; and

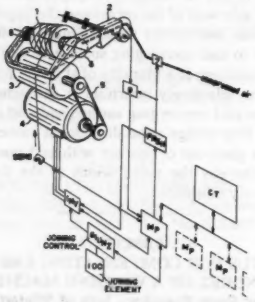
a carrier for said mounting means, said carrier being movable bodily in a direction to position said contact roll closer to or farther from said mandrel so that said contact roll will continue to contact the building yarn package during a package winding operation, said carrier being connected to said mounting means through a connection that includes a peg projecting from one of said mounting means and carrier, an opening in the other of said mounting means and carrier surrounding and spaced from said peg, and a member of flexible resilient material in surrounding relation to said peg in the space between and contacting said peg and said opening.

5,004,171

HIGH-PRODUCTIVITY BOBBIN WINDING METHOD AND DEVICES FOR ITS IMPLEMENTATION

Luigi Colli; Roberto Badiali, and Nereo Marangone, all of Pordenone, Italy, assignors to Savio S.p.A., Pordenone, Italy

Continuation of Ser. No. 256,776, Oct. 11, 1988, abandoned.
This application May 10, 1990, Ser. No. 522,173
Claims priority, application Italy, Nov. 13, 1987, 22624 A/87
Int. Cl.[5] B65H *54/22, 63/00, 67/08*
U.S. Cl. 242—35.6 R 8 Claims



1. A method for winding yarn onto a rotating bobbin driven by a drive roller and supported by a carrier arm when the yarn feed is broken and the bobbin is brought to rest each time the yarn breaks, comprising:

(a) restoring the broken yarn feed by means of an intervention cycle wherein said cycle has a first portion and a second portion wherein said first portion comprises the steps of:

(1) raising the rotating bobbin from the drive roller when the yarn feed is broken;

(2) braking the rotating bobbin and the drive roller independently until the bobbin stops rotating; and

wherein said second portion comprises joining the broken yarn; and

(b) interposing a variable time delay between the commencement of said bobbin braking step of said first portion and the commencement of said joining step of said second portion of said intervention cycle by means of a timer device wherein said variable time delay is determined by the amount of yarn wound on the bobbin, wherein the amount of yarn wound on the bobbin is determined by measuring the amount of time required for said braked bobbin to come to rest in a preceding time the yarn breaks.

5,004,172

TAKE-UP APPARATUS FOR AMORPHOUS METAL RIBBON

Masaaki Tanahashi; Hiroyuki Hagiwara, both of Kumagaya, and Hiroyuki Fujii, Kounosu, all of Japan, assignors to Hitachi Metals Ltd., Tokyo, Japan

Filed Jun. 21, 1989, Ser. No. 369,410
Claims priority, application Japan, Feb. 17, 1989, 1-37694
Int. Cl.[5] B65H *20/14, 18/00*
U.S. Cl. 242—54 R 17 Claims

1. A take-up apparatus for an amorphous metal ribbon comprising, in combination:

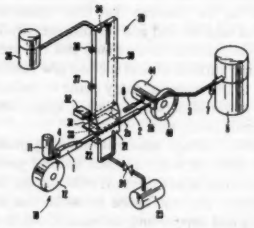
a first, second and third guide means providing a passage for an amorphous metal ribbon;

a storage means connected between said first and second guide means;

a take-up drum connected to said storage means through a second guide means; and

first gas suction means connected to said take-up drum through a third guide means to provide a flow of gas to draw said ribbon through said guide means, said storage means and said take-up drum

said storage means comprising a channel portion providing a passage for the ribbon, a storage container mounted on said channel portion and provided with an opening and



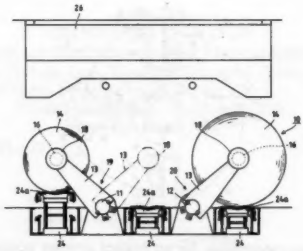
closing mechanism adjacent the channel portion, a second gas suction means disposed on a side of the storage container opposite to the opening and closing mechanism and a gas blowing means for introducing a gas under pressure to the channel portion for directing said ribbon into said storage container.

5,004,173

METHOD OF CONTROLLING WEB FEEDING DEVICE

Hideshi Kawai, Kasugai, Japan, assignor to Isowa Industry Company Ltd., Nagoya, Japan

Filed Apr. 10, 1989, Ser. No. 335,347
Claims priority, application Japan, Apr. 16, 1988, 63-94331
Int. Cl.[5] B65H *19/02*
U.S. Cl. 242—57 21 Claims



15. Apparatus for mounting a web roll, having a web of material coiled about an axis thereof, upon a pair of axially opposed center blocks, comprising:

support means;

a pair of arms, having said center blocks mounted upon end portions thereof, pivotably mounted upon said support means about a pivotal axis thereof and translatably movable along said pivotal axis so as to move said center blocks toward and away from each other between a first position at which said center blocks are axially spaced from each other so as to permit said web roll to be interposed between said center blocks during said loading and mounting of said web roll upon said center blocks of said arms, and a second position at which said center blocks are axially spaced from each other so as to permit said center blocks to engage opposite end portions of said web roll whereby said web roll will be mounted upon said center blocks;

a lifting device vertically movable within a vertical plane from a lowered position at which a web roll is deposited thereon to an elevated position at which said web roll can be mounted upon said center blocks;

means for pivotably moving said pair of arms, and said center blocks disposed thereon, from a first position displaced from said vertical plane of movement of said lifting device to a second position at which said center blocks intersect and are aligned with said vertical plane within which said lifting device is movable so as to await the arrival of said web roll elevated by said lifting device; and

means for moving said lifting device, vertically upwardly within said vertical plane from said lowered position toward said elevated position, until said axis of said web roll is aligned with the respective axes of said axially opposed center blocks disposed at said waiting position at which time said vertical movement of said lifting device is terminated.

5,004,174

APPARATUS FOR MANIPULATING ROLLS OF CONVOLUTED PAPER WEBS AND THE LIKE

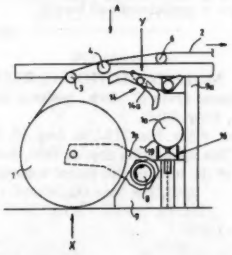
Robert Deutschle, Bokholt-Hanredder, Fed. Rep. of Germany, assignor to E. C. H. Will GmbH, Hamburg, Fed. Rep. of Germany

Filed Jul. 26, 1989, Ser. No. 385,811

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1988, 3825673

Int. Cl.[5] B65H *19/12*

U.S. Cl. 242—58.6 **19 Claims**



1. Apparatus for removing expired paper rolls from an unwinding station of a paper processing machine wherein a remnant of the web on an expired roll is severed from the already unwound length of the web and wherein the remnant of the web projects or tends to project from the roll subsequent to severing of the remnant from the already unwound length of the web, comprising conveyor means defining a predetermined path for axial movement of expired rolls; means for rotatably supporting discrete rolls at said unwinding station, said supporting means including means for confining the rolls at said unwinding station to rotation about a predetermined axis and said conveyor means comprising a plurality of rolling elements forming at least one file extending in substantial parallelisms with said predetermined axis; means for convoluting the projecting remnants around the respective expired rolls, said convoluting means being adjacent a portion of said path; and means for transferring discrete expired rolls from said unwinding station into said path, including means for moving expired rolls substantially at right angles to the axes of expired rolls.

5,004,175

WINDING CORE FOR MAGNETIC TAPE ADAPTED FOR STACKING

Jaeduck Lee, Inchon, Rep. of Korea, assignor to Saehan Media Corporation, Rep. of Korea

Filed Aug. 9, 1989, Ser. No. 391,429

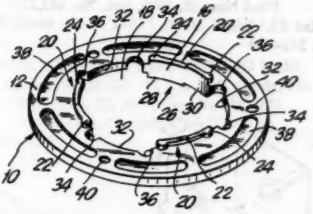
Claims priority, application Rep. of Korea, Mar. 28, 1989, 3463[U]

Int. Cl.[5] B65H *75/18*

U.S. Cl. 242—68.5 **1 Claim**

1. A winding core for magnetic tape, adapted to be sandwiched between a first like upper and a second like lower sandwiching core for stacking, comprising:

an annular body having top and bottom substantially annular body surfaces, an outer circumferential body surface for winding therearound and an inner circumferential surface, a plurality of projections equidistantly located around said inner circumferential surface and extending in outward directions from said top and bottom annular body surfaces, said projections each having first and second circular extensions, the first circular extension being higher than the second circular extension, and a corresponding plurality of recesses in said inner circumferential surface having circular notches in opposite edges thereof, said



recesses and notches and said projections and circular extensions being of a shape and dimension such that when the winding core is stacked between the first like upper core and the second like lower core, the projections and circular extensions from the bottom surface of the first upper core mate with corresponding recesses and notches of the winding core which is being sandwiched and the projections and circular extensions from the top surface of the second lower core mate with corresponding recesses and notches of the winding core which is being sandwiched and the higher and lower circular extensions from the bottom surface of the first upper core engage with corresponding lower and higher circular extensions from the top surface of the second lower core respectively.

5,004,176

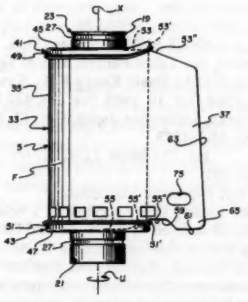
FILM CASSETTE

John J. Niedospial, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 8, 1990, Ser. No. 490,232

Int. Cl.[5] G03B *1/04, 17/26*

U.S. Cl. 242—71.1 **8 Claims**



1. A film cassette comprising (a) a spool core supported for rotation in a film unwinding direction to thrust a leader section of a film roll coiled about said spool core to the exterior of said cassette and in a film winding direction to return said leader to the exterior of the cassette, and (b) a pair of flanges arranged in spaced relation along said spool core to radially confine the leader and constructed of flexible material to allow them to be

flexed apart to permit the leader to readily escape the confinement of the flanges when the spool core is rotated in the unwinding direction, is characterized in that:

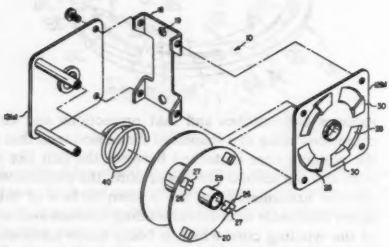
said leader has respective edge means for flexing said flanges apart one after the other, rather than simultaneously, when said spool core is rotated in the unwinding direction, whereby said leader can more easily overcome any resistance said flanges may present to movement of the leader outwardly of the flanges.

5,004,177

APPARATUS FOR BLOCKING A WINCH

James S. Somers, Dallas, Tex., assignor to Concord Industries, Inc., Addison, Tex.

Filed Nov. 28, 1989, Ser. No. 442,222
Int. Cl.[5] B65H *23/06, 75/00, 75/26*; B66D *5/32*
U.S. Cl. 242—99 **15 Claims**



1. A blocking winch comprising:

a reel having a central axis and including at least one blocking pin extending substantially parallel to the central axis and away from one end of said reel;

a frame for rotatably supporting said reel, said frame comprising opposed sideplates joined together to form said frame, one of said sideplates including at least one blocking aperture and a blocking disengaging ramp formed adjacent to and extending arcuately away from at least one blocking aperture along an arch corresponding to one direction of rotation of said reel;

a spring adapted for engagement with said frame and said reel for causing at least one blocking pin to engage at least one blocking aperture; and,

means for engaging said reel whereupon said spring is compressed to enable rotation of said reel.

5,004,178

SEAT BELT APPARATUS

Kyoji Kobayashi, and Takeo Furuya, both of Yokohama, Japan, assignors to Jidosha Denki Kogyo K.K., Kanagawa, Japan

Filed Oct. 16, 1989, Ser. No. 422,349
Claims priority, application Japan, Oct. 17, 1988, 63-261257; Oct. 17, 1988, 63-261258
Int. Cl.[5] B60R *22/42, 22/46*
U.S. Cl. 242—107 **3 Claims**

1. A seat belt apparatus comprising:

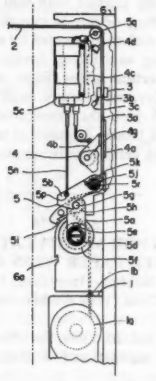
a sensor for sensing shock applied on a vehicle body;

take-up means secured to a base on said body;

a webbing having one end secured to said take-up mechanism for winding thereon and another end capable of being secured to the vehicle body upon being pulled out from the take-up mechanism;

webbing detecting means provided with a magnet attached to said webbing at a predetermined position and a switch means operable by said magnet and attached to the base for detecting a pulled out length of webbing;

restraining means for restraining the webbing between a damping member and a damping arm, and for releasing said webbing from restraint only for a predetermined time according to a switching operation or sensing of a shock by said sensor; and



webbing fold-up means for folding-up the webbing upon sensing a shock applied on the vehicle body when said detecting means detects that said webbing is pulled-up longer than a predetermined length.

5,004,179

MOLDED SECTIONAL REEL

James S. Salloum, Oxford, Mich., assignor to Creative Techniques, Inc., Troy, Mich.

Continuation of Ser. No. 232,116, Aug. 15, 1988, Pat. No. 4,895,316. This application Sep. 1, 1989, Ser. No. 401,868
The portion of the term of this patent subsequent to Jan. 15, 2008, has been disclaimed.
Int. Cl.[5] B65H *75/14, 75/22*
U.S. Cl. 242—118.6 **18 Claims**

1. A reel formed of a central hub with radially outwardly extending flanges on the opposite ends of the hub, comprising:

the hub being a plastic molded, thin-wall, relatively wide ring having an exterior wall surface, about which a reeled article may be wound, and an interior wall surface defining a hollow open cylindrical interior space, and opposite, narrow, annular edges defining the opposite ends of the ring;

said flanges being formed of generally flat, disk-like plastic moldings having a central portion for overlying the ends of the hub and an outer portion for extending radially outwardly of the hub;

means forming a grooved seat on each of the faces of the flanges adjacent to the hub ends, with said means being shaped to engage their adjacent thin-wall relatively wide ring hub ends for positioning the hub ends and flanges against movement relative to each other;

a number of elongated passageways integrally molded on the interior surface of the hub wall, with the passageways being circumferentially spaced apart and being arranged

parallel to the axis of the hub said passageways extending a desired distance radially inward from said interior surface of the hub wall and maintaining said hollow open cylindrical interior space;

elongated fasteners extending through the passageways and through corresponding aligned openings formed in the flange portions overlapping the ends of the hub, and with the fasteners rigidly securing the flanges to the hub;

said flanges being formed of plastic molded, substantially identical, radial sections, with each section having an exterior peripheral edge defining a portion of the periphery of the flange and having an outer portion forming part of the flange between the flange peripheral edge and the hub, and an inner portion overlapping a portion of the hub;

the adjacent radially directed edges of each section being formed to interengage with each other and being fastened together to form the rigid complete flanges;

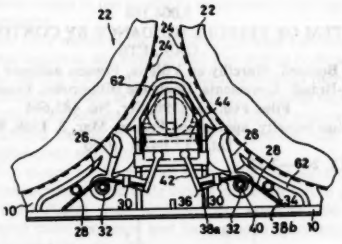
whereby different flange sections may be interchanged and fastened together and to the hub for forming an assembled reel.

5,004,180

MAGNETIC TAPE CASSETTE

Masatoshi Okamura; Takashi Namioka, and Haruo Shiba, all of Nagano, Japan, assignors to TDK Corporation, Japan

Continuation of Ser. No. 334,214, Apr. 6, 1989, abandoned. This application Jul. 26, 1990, Ser. No. 558,779
Claims priority, application Japan, Apr. 11, 1988, 63-47709
Int. Cl.[5] G11B *23/04*
U.S. Cl. 242—198 **7 Claims**



1. A magnetic tape cassette comprising:

a casing;

a pair of reel hubs rotatably arranged in said casing and having a magnetic tape wound thereon;

said reel hubs each being provided with a locked portion through which said reel hub is selectively locked;

a pair of hub braking levers arranged in said casing so as to be pivotally moved in said casing to be respectively engaged with said locked portion of each of said reel hubs; and each of said reel hubs further comprising;

a respective spring for impinging on each of said pair of hub braking levers, each respective spring constantly urging said hub braking lever in a direction of engaging said hub braking lever with said locked portion of said reel hub;

each of said hub braking levers being provided thereon with an urging element for urgingly holding one side portion of said spring in a longitudinal direction thereof and with a support element for supporting an intermediate portion of said spring;

a pivot element mounted on an inner surface of said casing, said support element being pivotally mounted on said pivot element to project therefrom such that each of said hub braking levers can be pivotally mounted about said pivot element;

said casing being provided thereon with a holding element for holding the other side of said spring in the longitudinal direction thereon;

said urging element, support element and holding element being arranged so as to cooperate together to hold said spring deflected in a normal state and cause said spring to be further deflected about said support element when said hub braking lever is urged through said urging element;

each of said hub braking levers being provided thereon with a contact element for abuttedly holding the end of the portion of the spring located to one side of the intermediate portion of the spring, said portion oriented in a longitudinal direction of the spring, to prevent displacement of said spring;

and the cassette casing abuttedly contacts the end of the portion of the spring located to the other side of the intermediate portion of the spring, said portion oriented in a latitudinal direction of the spring such that displacement of the spring is prevented.

5,004,181

CORDLESS ELECTRIC FISHING REEL

Arthur D. Fowles, 14526 SW. 42 Ave. Rd., Ocala, Fla. 32673

Filed Oct. 27, 1989, Ser. No. 427,774
Int. Cl.[5] A01K *89/00*
U.S. Cl. 242—225 **3 Claims**

1. A cordless electric fishing reel in combination with a fishing pole, the fishing pole including an elongate hollow handle in alignment with the fishing reel, and

an electric motor mounted within the handle, and

the fishing reel including rewind gearing coupled to an output shaft, the output shaft coaxially aligned with a ratchet means mounted in alignment with the reel for uni-directional rotative coupling of the output shaft with the electric motor, and

switch means mounted on the handle for selective actuation of the electric motor, and

including a battery pack mounted within the handle in electrical communication to the switch means and to the electric motor, and

wherein a first sun gear is mounted to the electric motor, the first sun gear medially mounted to a series of first planetary gears, the first planetary gears coupled to a second sun gear, the second sun gear coupled medially to a second series of planetary gears, and the second planetary gears coupled to a planetary output shaft, wherein the planetary gear output shaft is coupled to the ratchet means, and

wherein the ratchet means includes a ratchet input shaft integrally mounted to a ratchet support plate, the ratchet support plate including a plurality of pawl levers diametrically opposed relative to one another biased exteriorly of the ratchet support plate, and the pawls mounted interiorly of an internally geared ratchet drum, wherein a first rotation of the output shaft couples the output shaft to the planetary gear output shaft, wherein a second rotation in a reverse rotation relative to the first rotation disengages the planetary gear output shaft in association with the output shaft wherein the switch means includes a lever mounted orthogonally relative to the elongate hollow handle, and wherein the switch means includes an oval opening formed medially of the switch means for unobstructed reception of the planetary gear output shaft therethrough, wherein a lowermost end of the switch means includes a plurality of contacts for electrical association of the battery pack with the electric motor.

5,004,182

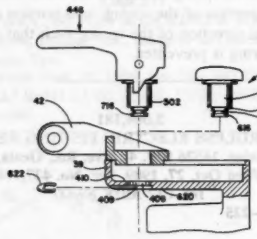
CONVERTIBLE BAIL OPENING SYSTEM

Richard R. Councilman, Collinsville, Okla., assignor to Zebco Corporation, Tulsa, Okla.

Continuation of Ser. No. 208,836, Jun. 15, 1988, abandoned, which is a continuation of Ser. No. 922,396, Oct. 23, 1986, abandoned. This application Jan. 3, 1990, Ser. No. 462,848

Int. Cl.[5] A01K *89/01*

U.S. Cl. 242—232 14 Claims



1. In combination:

a fishing reel having a line-carrying spool, a rotor, a crank handle operable through a gear train to rotate the rotor and thereby direct line onto the spool, and a bail on the rotor and having associated first and second arms attached to the rotor for rotation relative thereto so as to thereby be movable between a closed retrieving position and an open casting position;

a first post;

a trigger;

means on the first post for mounting the trigger for movement relative to the first post between a first position and a second position;

cooperating means on the first post and rotor for removably attaching the post to the rotor so that the post supports one of the first and second arms on the rotor for rotation relative to the rotor about said post;

cooperating means on the trigger and bail for causing the bail to be moved from the retrieving position towards the casting position in response to said trigger being moved from said first position to said second position with said first post attached to the rotor;

a bail supporting member having a second post and having no means as on said first post for mounting a trigger thereon; and

cooperating means on the second post and rotor for removably attaching the second post to the rotor to support the one of the first and second arms on the rotor for rotation relative to the rotor about the second post on the bail supporting member,

whereby with the second post on the bail supporting member attached to the rotor the bail must be manually moved by a user from the closed position to the open position and a user can selectively, interchangeably attach and use one of the trigger and associated first post and bail supporting member and second post so that the reel can be used with and without a trigger at the desire of a user.

5,004,183

SWITCHED COMPARATOR SYSTEM FOR OBTAINING DYNAMIC RANGE

Bobby R. Jarrett, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 23, 1975, Ser. No. 579,190

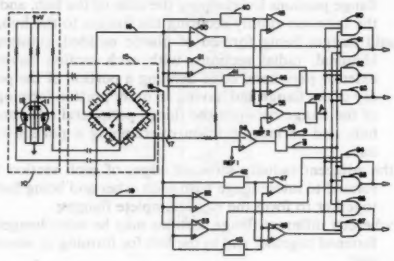
Int. Cl.[5] F41G *7/00*

U.S. Cl. 244—3.11 12 Claims

1. A switched comparator device for obtaining dynamic range in a bang-bang system comprising:

means for monopulse summing of an input signal and having outputs representative of the sums;

a low level bank of comparators operatively connected to the outputs of said summing means;



a high level bank of comparators operatively connected to the outputs of said summing means; and

means to electrically multiplex either said high level or low level bank of comparators.

5,004,184

SYSTEM OF VEHICLE GUIDANCE BY CONTINUOUS GAS JETS

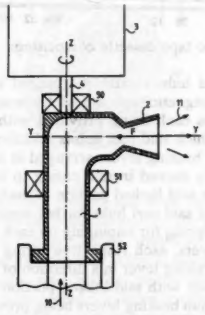
Marc Bernard, Marcilly en Villette, France, assignor to Thomson-Brandt Armements, Boulogne Billancourt, France

Filed Feb. 23, 1990, Ser. No. 483,644

Claims priority, application France, Mar. 3, 1989, 89 02785

Int. Cl.[5] F42B *10/66*

U.S. Cl. 244—3.22 5 Claims



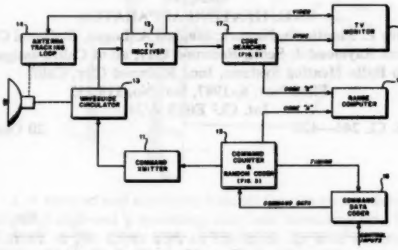
1. A guidance system using continuous gas jets to control the pitch, yaw, and roll of a vehicle, said guidance system comprising: a gas generator and three nozzles which can be continuously supplied form the gas generator, the nozzles being positioned at substantially 120° in a same plane transverse to a longitudinal axis of the vehicle, said nozzles being located at the periphery of the vehicle, each of the nozzles supplying a thrust and being mobile in rotation about a first axis substantially parallel to said longitudinal axis, the thrust of each of the nozzles being contained substantially within the transverse plane, wherein an angle of deflection of each of the nozzles is contained within a predetermined maximum angle of deflection.

5,004,185

AIR-SURFACE-MISSILE DATA LINK SYSTEM

John C. Lockhart, Jr., Oreland, Pa.; Standish C. Hartman, Flemington, N.J.; Bruce R. Meuron, Willow Grove, and Joseph B. Lyons, Jr., Philadelphia, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 31, 1964, Ser. No. 394,388
Int. Cl.[5] F41G 7/00
U.S. Cl. 224—3.14 6 Claims



1. An aircraft-missile communications system in which an aircraft and a missile interchange information by coded signals comprising:

first code means in the aircraft to generate a first digital code sequence;

transmitter means in the aircraft to transmit said first digital code sequence;

receiver means in the missile to receive said first digital code sequence;

second code means in the missile to generate a second digital code sequence the same as said first digital code sequence and having scan sync information contained therein;

synchronizer means in the missile to synchronize said second digital code sequence with said first digital code sequence;

transmitted means in the missile to transmit said second digital code sequence;

receive means in the aircraft to receive said second digital code sequence third code means in the aircraft to generate a third digital code sequence the same as said second digital code sequence and having scan sync information contained therein; and

synchronize means in the aircraft to synchronize said third digital code sequence with said second digital code sequence.

whereby said digital codes are synchronized for the interchange of information between the aircraft and the missile.

5,004,186

FINLOCK ALIGNMENT MECHANISM FOR ROCKETS

Paul C. Hans, Scottsdale, Ariz., and Gary C. Rosenfield, Las Vegas, Nev., assignors to Aerotech, Inc., Las Vegas, Nev.

Filed Jun. 1, 1990, Ser. No. 531,938
Int. Cl.[5] F42B 10/06
U.S. Cl. 244—3.25 14 Claims

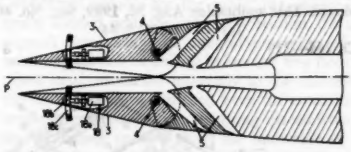
1. For use in a recreational rocket having a body portion and a motor tube mounted therewith, a finlock mechanism comprising a finlock ring member disposed in circumscription about the motor tube within the body portion, a plurality of rocket fins, each said fin having a body portion and a root portion, said root portion being extendible through said rocket body portion for snap-lock engagement within said ring member to hold said fin body portion in truly aligned and secure surface-to-surface engagement with said rocket body portion.

5,004,187

SYMMETRICAL, TWO DIMENSIONAL, SUPERSONIC AND HYPERSONIC AIR INTAKE FOR THE COMBUSTION AIR OF AN AIRCRAFT ENGINE

Francois Falempin, Saint Michel sur Orge, France, assignor to Office National D'Etudes et de Recherches Aerospatiales, France

Filed Jul. 28, 1989, Ser. No. 386,110
Claims priority, application France, Aug. 4, 1988, 88 10558
Int. Cl.[5] B64D 33/02
U.S. Cl. 244—53 B 3 Claims



1. Two dimensional air intake, operating at supersonic and hypersonic speed ranges for ensuring the combustion air supply of an aircraft engine, comprising two pivoting front flaps (3) forming respective visors, the front flaps defining an open inlet therebetween having a variable inlet section and being disposed symmetrically on respective sides of a longitudinal plane (P), each front flap (3) being movable about a pivoting axis (4) situated in the vicinity of the air intake wall which extends the front flap considered, characterized by the fact that the pivoting axis (4) of each front flap (3) is situated immediately adjacent a first boundary layer trap (5) disposed in the air intake wall which extends said front flap (3).

5,004,188

AIRBRIDGE

Peter Donneky, Wiltshire, England, and Peter T. Gacs, Portola Valley, Calif., assignors to GEC Mechanical Handling Limited, England

PCT No. PCT/GB88/00640, § 371 Date Jun. 5, 1989, § 102(e) Date Jun. 5, 1989, PCT Pub. No. WO89/00946, PCT Pub. Date Feb. 9, 1989
PCT Filed Aug. 3, 1988, Ser. No. 339,618
Claims priority, application United Kingdom, Aug. 3, 1987, 8718300
Int. Cl.[5] B64D 9/00
U.S. Cl. 244—137.002 4 Claims

1. An airbridge, comprising:

a telescopic passageway extending along a longitudinal axis between a passenger terminal end and an aircraft end;

a cabin assembly at the aircraft end of the passageway pivotably coupled to the passageway by a horizontal transverse pivot, said cabin assembly having a floor and a top;

a wheeled elevating support structure for the cabin assembly in the form of a single vertical, extendible elevator leg, said leg having an upper end which projects through the cabin assembly between the floor and the top of the cabin assembly substantially through the longitudinal axis of the passageway, said upper end of the leg being secured to the cabin assembly for effecting the raising or lowering of the latter, and of the adjacent end of the passageway, and leveling means for varying the relative angular position of the cabin assembly and the passageway for maintaining the floor of the cabin assembly and the axis of the elevating support structure substantially horizontal and substantially vertical, respectively, through varying angles of inclination of the passageway; and

said cabin assembly being offset partially to one side of the longitudinal axis of the passageway to provide a path which permits traversal of passengers through the cabin assembly on one side of the elevator leg.

5,004,189

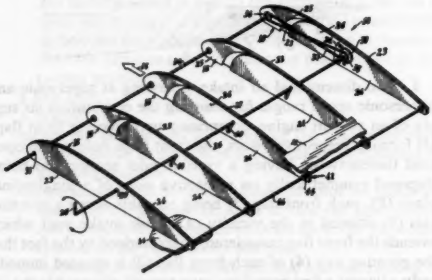
RECONFIGURABLE AIRFOIL

Dale J. Igram, 4308 Brookside Dr., Kokomo, Ind. 46902

Continuation-in-part of Ser. No. 238,473, Aug. 31, 1988, abandoned. This application Aug. 30, 1989, Ser. No. 400,782

Int. Cl.[5] B64C *3/44*

U.S. Cl. 244—219 **8 Claims**



1. An airfoil having an upper panel means and a lower panel means, operatively interconnected, and which are spaced apart and shaped to have aerodynamic airfoil property when in forward motion relative to the surrounding air, the airfoil having means for changing the spacing of the panel means, thereby to change the aerodynamic property, and the airfoil also carries a flap panel means which extends from the lower panel means to the upper panel means, the flap panel means being movably interconnected tothe lower panel means and is slidable with respect to the upper panel means;

the flap panel means being positioned along the forward edge of the upper panel means and the lower panel means;

a set of stationary support means to which the lower panel means are connected;

a set of movable support means to which the upper panel means are connected;

a first rotatable shaft means;

the said first rotatable shaft means being fixedly located with respect to the lower panel means and stationary support means, but rotatable with respect thereto;

means for rotating the first rotatable shaft means;

drive means which are operatively carried by the first rotatable shaft means; and

driven means carried by the movable support means, and drivable by the drive means to move the upper panel means with respect to the lower panel means for achieving the same shape-changing of the airfoil in correspondence to the rotation of the said first rotatable shaft means;

in a combination which includes a second rotable shaft means whose axis is fixedly located with respect to the lower panel means and the stationary support means, but is rotatable thereto, and non-rotatable with respect to the flap panel means;

and one of the said second rotatable shaft means and the flap panel means carries a driven means;

and a drive transmission means operatively interconnecting the driving means and the driven means which is carried by one of the second rotatable shaft means and flap panel means, for co-ordinating movement of the upper panel means and the flap panel means.

5,004,190

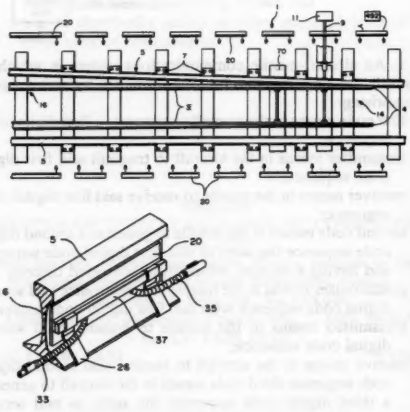
RAIL HEATING APPARATUS

Garry L. Montierth, Newark; Stephen A. Logan, Redwood City, and Raymond J. Scott, Redwood City, all of Calif., assignors to Bylin Heating Systems, Inc., Redwood City, Calif.

Filed Nov. 6, 1987, Ser. No. 118,212

Int. Cl.[5] E01B *7/24*

U.S. Cl. 246—428 **20 Claims**



1. A rail heating system for heating a railroad rail having a contoured web, the rail being supported by support means that holds the rail in place, the rail heating system comprising:

a heating pad having a flexible contact surface with sufficient flexibility to deform to match the contour of said rail web;

clip means for pressing the heating pad contact surface into contact with a portion of the rail web and deforming the contact surface to match the contour of the contacted portion of the rail web.

11. A rail switch heating system for heating a railroad switch having a point area and a heel area, the switch including a switch rail point, a stock rail having a web, support means for holding the stock rail in place, the support means effectively dividing the stock rail into a plurality of rail segments, and a switch rod for moving the switch rail point between a first position and a second position, the rail heating system comprising:

a plurality of side heaters, each said side heater having a flexible contact surface with sufficient flexibility to deform to match the contour of said rail web and being adapted for attachment to a single rail segment;

clip means for securing the side heaters to the stock rails and pressing the flexible contact surface into contact with the rail web along its entire length;

and

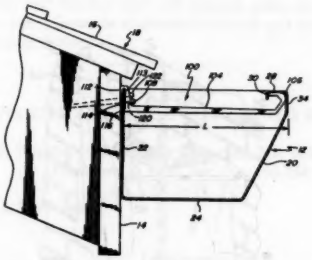
power receiving means for connecting said side heaters to an external power supply.

5,004,191

RAIN GUTTER SUPPORT AND MOUNTING BRACKET

Durrell Corry, 18371 Edgewood, Villa Park, Calif. 92667

Filed Oct. 10, 1989, Ser. No. 418,490
Int. Cl.[5] E04D *13/00*
U.S. Cl. 248—48.2 8 Claims



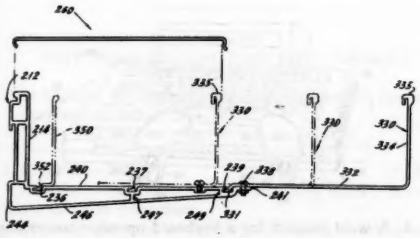
1. A support and mounting bracket for rain gutters having an exposed side and a mounting side, said mounting side having formed at the upper end an L-shaped lip with a horizontal surface and a vertical surface, said support and mounting bracket comprising an elongate, slender and substantially straight body portion which terminates at an outer end portion with an upwardly extending angle region configured for fitting within said lip of the rain gutter so as to support the exposed side of the rain gutter and which terminates at an inner end portion having a hooked region into which an upper edge of the mounting side of the rain gutter fits upwardly, said outer end portion of the bracket body portion being formed having a lower ramping surface means which is sloped upwardly and outwardly for encircling the bracket outer end portion to be pushed downwardly past an upper, outer edge region of a rain gutter when the upper edge of the mounting side of the rain gutter is positioned in the hooked region of the bracket inner end portion, said ramping surface flexing regions of said upper edge region of the rain gutter outwardly and said inner end region being formed with a downwardly and outwardly inclined aperture through which an elongate attachment, such as a nail or screw, can be installed to mount the rain gutter to a facia plate or the like.

5,004,192

SIDE SUPPORTED CABLE TRAY

Isidore Handler, 2960 Kinloch Rd., Wantagh, N.Y. 11793

Filed Aug. 2, 1988, Ser. No. 227,377
Int. Cl.[5] F16L *3/00*
U.S. Cl. 248—49 24 Claims



1. A section of a cable tray for being mounted to an upstanding surface, the cable tray section comprising an upstanding wall mounting section for being attached to an upstanding surface and a tray floor for supporting cable placed on the tray floor, the tray floor being attached to the wall mounting section and extending transversely to it and away from the wall mounting section in an outward direction;

the cable tray section having opposite longitudinal ends, each end adjoining the end of an adjacent cable tray section, for defining an elongate cable tray of a plurality of the cable tray sections;

the wall mounting section having a top part above the floor, the top part having an external wall for being mounted to the upstanding surface to which the cable tray section is to be attached; means for mounting the external wall to the upstanding surface; the wall mounting section having an internal wall spaced outward from the external wall and also facing outward from the wall mounting section toward the tray floor, the external wall and the internal wall being attached integrally to each other and being spaced apart for defining a hollow interior space of the wall mounting section, whereby the external wall and the internal wall define a truss for stiffening the wall mounting section; the internal and external walls extending down to the tray floor;

the wall mounting section having opposite ends, the hollow interior spaced of the wall mounting section being shaped for receiving a splice shunt block which extends into the hollow interior space at the adjacent ends of neighboring cable tray sections;

an additional support for the cable tray section and integrally formed with the cable tray section, the additional support comprising; an integral extension of the wall mounting section extending below the tray floor; an additional strut connected integrally to the extension below the floor, extending outward from the extension and extending beneath the floor, and being spaced from the floor and extending up to contact the underside of the floor outward from the internal wall, so that the additional support is shaped for extending partway across the floor to strengthen the floor, and the additional support cooperates with the tray floor to provide a truss support for stiffening the floor;

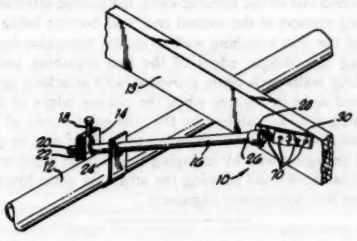
the wall mounting section, the additional support and the tray floor being integral for the truss support of the floor to transfer the load to the truss of the wall mounting section to prevent deformation of the tray floor, of the wall mounting section and of the location where they meet.

5,004,193

ADJUSTABLE LOAD BOLT ADAPTER BRACKET ASSEMBLY

Kraig A. Kirschner, P.O. Box 3365, South El Monte, Calif. 91733

Filed Jun. 11, 1990, Ser. No. 537,907
Int. Cl.[5] F16L *3/00*
U.S. Cl. 248—59 11 Claims



1. An adjustable bracket assembly for selective use with a varying number of fasteners to secure a bracing element to affixed structure, said assembly comprising:

an attachment member having means thereon for engaging the bracing element and defining a flat plate portion extending from said means and having a pair of axially aligned fastener receiving apertures therein;

and an adapter plate for cooperation with said attachment member to provide additional fastener receiving apertures for the securement of the bracing element to the structure,

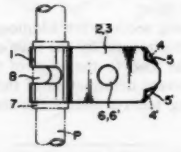
said plate defining a first portion having a first fastener receiving aperture disposed therein, a second portion vertically offset from said first portion and extending parallel to said first portion and defining a pair of fastener receiving apertures therein, a first engagement member projecting from said first portion toward said second portion and being vertically offset from said second portion so as to engage the extended end of said attachment member upon said second portion of said adapter plate being disposed on said flat plate portion of said attachment member and the apertures in said second portion being disposed over and aligned with the apertures in said attachment member, and a pair of second engagement members projecting from said second portion toward said first portion and being vertically offset from said first portion so as to engage the extended end of said attachment member upon said first portion of said adapter plate being disposed on said flat plate portion of said attachment member and the aperture in said first portion being disposed over and aligned with one of the apertures in said attachment member, whereby said bracket assembly can accommodate either two, three or four fasteners for securing the bracing element to the structure.

5,004,194

PIPE/WIRE GRIPPING AND FIXING CLAMP

Hideaki Watanabe, Mishima, Japan, assignor to Usui Kokusai Sangyo Kaisha, Ltd., Japan

Filed May 11, 1990, Ser. No. 523,055
Claims priority, application Japan, May 15, 1989, 1-121178
Int. Cl.[5] F16L *3/08*
U.S. Cl. 248—74.5 **6 Claims**



1. A pipe/wire gripping and fixing clamp comprising an elongated unitary metallic band, having opposed first and second ends and being formed to define a curved gripping wall intermediate the ends, a first attaching wall extending from the gripping wall to the first end of the metallic band, the first attaching wall being cut at the first end to define oblique edges, a second attaching wall extending from the gripping wall to the second end of the metallic band, the second attaching wall defining corners at the second end, said corners being folded toward the first attaching wall to define triangular hooks for latching the oblique edges of the first attaching wall, said attaching walls each being provided with attaching apertures disposed to be in register when the oblique edges of the first attaching wall are latched by the triangular hooks of second attaching wall, whereby a member to be fixed may be gripped in the engaging wall by engaging the oblique edges with the triangular hooks and pressing the attaching walls toward one another into superposed alignment.

5,004,195

RACK FOR FLEXIBLE COLLECTION BAGS

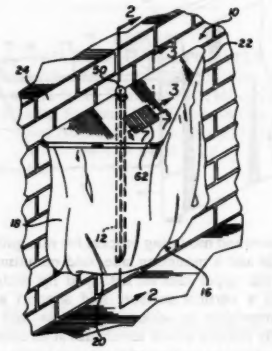
Jonothon M. W. McIntyre, North Hollywood, Calif., assignor to Lomac Corporation, Encino, Calif.

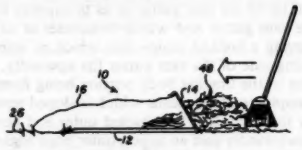
Continuation-in-part of Ser. No. 379,287, Jul. 13, 1989. This application Mar. 21, 1990, Ser. No. 498,264
Int. Cl.[5] B65B *67/04*
U.S. Cl. 248—99 **21 Claims**

1. A rack for supporting a flexible collection bag in an open configuration, the rack comprising:

a stake including a lower end, a receiving slot adjacent to an upper end thereof, and an inner surface;

a bag support ring having a primary plane and including a rear support member and at least one front support member which lie in the primary plane, wherein the rear support member includes an integral U-shaped support anchor offset from the primary plane, the support anchor





being inserted through the stake receiving slot and engaging the stake inner surface to fix the bag support ring relative to the stake; and

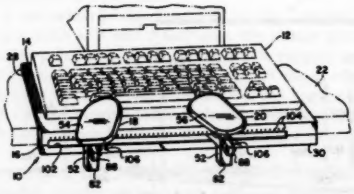
a cap slidably positioned over the upper end of the stake to substantially enclose the stake receiving slot and prevent unintended disassociation of the bag support ring from the stake.

5,004,196

KEYBOARD ACCESSORY

Clifford Gross, Deer Park, N.Y., assignor to Biomechanics Corporation of America, Melville, N.Y.

Filed Nov. 15, 1989, Ser. No. 436,704
Int. Cl.[5] A47F *7/100*
U.S. Cl. 248—118.3 **11 Claims**



1. A wrist support for a keyboard operator comprising a wrist-supporting member having a pad at its upper end having an operative position in supporting relation beneath said operator's wrist and having connected in depending relation therefrom a cylindrical post, said cylindrical post having a vertical orientation of an array of spaced horizontally oriented notches thereon, a housing having a cylindrical opening to receive in projected relation therein said post, and a spring-biased pawl pivotally mounted on said housing in facing relation to said

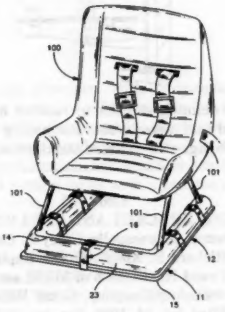
array of notches and normally biased into contact with said post, whereby the interengagement of said pawl in a selected one of said notches maintains said pad in a corresponding selected vertical position preparatory to use by said operator; including a rectangular support plate having upper and lower edges mounted in bearing means for opposite direction transverse movements, and a leg connected in spanning relation between said bracket and said support plate to additionally impart said transverse movements to said pad incident to the positioning thereof.

5,004,197

PROTECTIVE APPARATUS FOR A CHILD RESTRAINT SEAT

Karl R. Weekley, 935 Landmark, Pevely, Mo. 63070

Filed Jan. 8, 1990, Ser. No. 461,753
Int. Cl.[5] A47C *3/02*
U.S. Cl. 248—188.9 **9 Claims**



1. A protective apparatus for a child restraint seat comprising:

a. a first base with three sequentially connected C-shaped arms;

b. a channel formed within the C-shaped arms to receive a portion of the legs of the child restraint seat;

c. a longitudinally oriented opening in the C-shaped arms allowing access to the channel;

d. a second base having a bottom wall and three sequentially connected side walls connected to the bottom wall forming a chamber to receive the first base;

e. the side walls having an overhanging lip to secure the first base within the chamber; and

f. an entrance port in the second base allowing the first base to be placed within the chamber.

5,004,198

FIXTURE-MOUNTING POST AND ASSEMBLY METHOD THEREFOR

Paul A. Jager, Muskegon, Mich., assignor to Interior Specialists Corporation, Spring Lake, Mich.

Filed Mar. 6, 1990, Ser. No. 489,360
Int. Cl.[5] E04G *5/06*; A47G *29/02*
U.S. Cl. 248—225.1 **23 Claims**

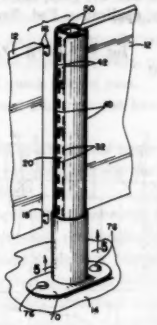
1. A fixture-mounting post for mounting one or more fixtures, said post comprising

(a) an elongate member defining at least one mounting means for mounting at least one fixture,

(b) an elongate shroud having opposite ends and being disposed around said member, said shroud having at least one pair of elongate edges extending to at least one of said ends, said edges being separated from each other to permit access to said mounting means,

(c) a sleeve enclosing a portion of said shroud at said one end, and

(d) resiliently compressible means compressed between said member and the enclosed portion of said shroud for pressing said enclosed portion outwardly to effect tight fit between said enclosed portion and said sleeve.

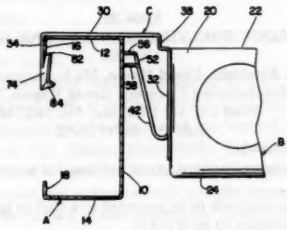


5,004,199

BRACKET

Eugene J. Suk, Pittsburgh, Pa., assignor to American Electric FL Industries, Inc., Division, Memphis, Tenn.

Filed May 14, 1990, Ser. No. 522,987
Int. Cl.[5] H02G *3/00*; F16B *2/00*
U.S. Cl. 248—231.8 **28 Claims**



28. A bracket for mounting electrical boxes to wall studs, said bracket including a web having a pair of first and second opposed flanges extending therefrom and between which a wall stud is receivable, said first flange having a free end portion remote from said web, a resilient arm extending from said free end portion of said first flange back toward said web in inwardly inclined spaced relationship to said first flange, said arm having an arm terminal end portion adjacent said web, and stud gripping means on said arm terminal end portion and on said second flange for gripping a stud therebetween, said second flange having opposite side edges and a terminal end, extensions extending outwardly from said side edges adjacent said terminal end, said stud gripping means on said second flange being on said extensions and comprising a plurality of barbs on each of said extensions spaced-apart longitudinally of said second flange, said plurality of barbs on each said extension including an initial barb located closest to said web and a terminal barb located closest to said terminal end of said second flange, and said terminal barbs extending inwardly of said second flange a greater distance than said initial barbs.

5,004,200

SHELF BOARD FITTING

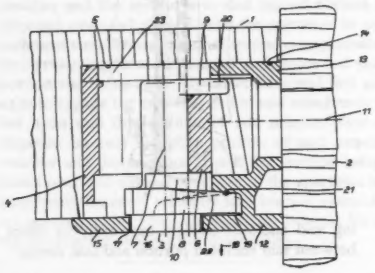
Rüdiger Walz, Nagold-Hochdorf, Fed. Rep. of Germany, assignor to Häfele KG, Nagold, Fed. Rep. of Germany

Filed Oct. 17, 1989, Ser. No. 422,764

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1988, 8813183

Int. Cl.[5] A47B *57/04*

U.S. Cl. 248—250 **10 Claims**



1. In a fitting for a board, particularly for a shelf board, the fitting including a support member having a groove, the support member being attached to the board, and a fastening member which engages in the groove of the support member and is adapted to be inserted in a wall component in a direction of insertion, the improvement comprising the fastening member having a groove-like recess which extends transversely of the direction of insertion of the fastening member, a locking disk being rotatably mounted in the support member for engaging the recess of the fastening member, wherein the locking disk is rotatable between a locked position and an unlocked position of rotation, the locking disk releasing the fastening member when the locking disk is in the unlocked position of rotation.

5,004,201

INTERLOCK SHELVING BRACKET AND STANDARD COVER

Walter L. Bessinger, Grand Haven, Mich., assignor to Knape & Vogt Manufacturing Company, Grand Rapids, Mich.

Filed Jul. 14, 1989, Ser. No. 381,148

Int. Cl.[5] A47G *29/02*

U.S. Cl. 248—243 **18 Claims**

1. A shelving standard, cover and bracket assembly comprising:

vertical standards to be mounted to a wall in spaced parallel relationship to each other;

said standards each having a front face and a pair of spaced side faces;

said standard front face having a plurality of vertically spaced elongated slots and intermediate webs for attachment of cantilever brackets thereto;

an elongated cover on each of said standards;

said cover having a pair of legs for engaging said standard side faces;

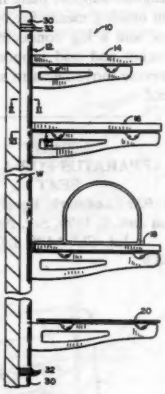
said cover having a plurality of vertically spaced elongated slots to generally align with said standard slots, and intermediate webs between said slots;

said cover slots having greater length than said standard slots and said standard webs having a greater length than said cover webs, whereby portions of said standard webs at said front face remain exposed adjacent said standard slots;

cantilever brackets each having side walls and having at least two rear lugs projecting from one end thereof to be inserted through said cover slots and through said standard slots to anchor on and engage behind said standard webs;

said lugs extending rearwardly and then downwardly;

said bracket having a rear edge surface area spaced forwardly of said lugs, said surface area having receiving



portions defining cavities to receive both said standard webs and said cover webs, and having an abutment portion to engage said exposed standard web portions.

5,004,202

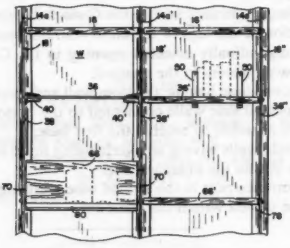
BOOK END BRACKET AND SHELVING SYSTEM

William E. Stumpf, Minneapolis; Casey L. Carlson, Edina, both of Minn.; Richard S. Knape, Grand Rapids, and Walter L. Bessinger, Grand Haven, both of Mich., assignors to Knape & Vogt Manufacturing Company, Grand Rapids, Mich.

Filed Jul. 14, 1989, Ser. No. 381,122

Int. Cl.[5] A47G *29/02*

U.S. Cl. 248—243 **14 Claims**



1. A shelf assembly capable of having the shelf in a flat position or a tilted display position, comprising:

a pair of vertical slotted standards for mounting to a wall in spaced relationship;

at least one pair of cantilever brackets, each having lugs on one end for engagement in said slotted standards, and each having means forming two pairs of connector receiving openings therein, the openings of each pair being the seam distance apart, one pair being in a horizontal plane to hold a shelf in horizontal position and the other pair being in a diagonal plane to hold a shelf in a diagonal position; and

a shelf having a pair of mounting connectors at the ends thereof, said connectors being of dimensions to be received by either of said alternate pairs of openings and being spaced apart the same distance as said openings in said pairs, for alternate mounting of said shelf in horizontal or tilted diagonal orientation;

said shelf having reinforcing beams recessed into the under-

side thereof, said beams having channels therein, and said connectors being telescopically slidably received in said channels; and

said connectors are mounting pins having flexible peripheral projections causing a friction fit in said channels.

5,004,203

SUPPORTING ARM

Albert Fabius, Ingelandenweg 1, 1069 WE Amsterdam, Netherlands

Filed Dec. 26, 1989, Ser. No. 457,311

Claims priority, application Netherlands, Dec. 23, 1988, 8803162

Int. Cl.[5] E04G *3/00*

U.S. Cl. 248—285 **15 Claims**

1. Supporting arm provided with telescoping members which cooperate by means of roller bearings for supporting a load in an essentially horizontally displaceable manner, wherein the telescoping members consist of sections with a closed polygonal cross section, and all roller bearing races are internal or external section faces with a generally planar surface.

5,004,204

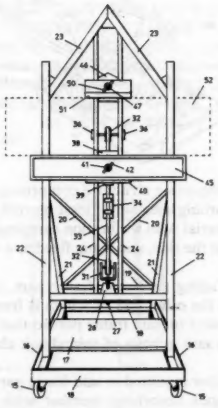
STUDIO EASEL

Charles T. Cook, 357 Richfield Dr., Apt. 1, San Jose, Calif. 95129

Filed Jul. 18, 1989, Ser. No. 381,266

Int. Cl.[5] A47B *97/04*

U.S. Cl. 248—449 **1 Claim**



1. An artist's easel, comprising:

a base, a vertical upright frame, and a canvas tray holder, said base and said frame supporting said canvas tray holder in equilibrium,

a rectangular horizontal base frame having casters,

said upright frame being mounted on said rectangular horizontal base frame,

a base support shelf positioned between said horizontal base frame members with a plurality of holes at the back ends of said horizontal base frame members for vertical or inclined positioning of said upright frame,

a cross brace and a rear brace member having thereon a pair of inclined segments supporting said upright segments and connected at pivot points to said upright segments, the opposite ends of said inclined segments connected to holes on said horizontal base frame members, respectively, and secured by a pair of quick release pins,

a crossbar fixed between and near the lower ends of said upright segments,

a pair of parallel spaced apart vertical angle bars connected at mid-center of said crossbar and near the top ends of said upright segments,

a pair of brace members being connected to said uprright segments, respectively, and converging upwardly to the top ends of said vertical angle bars, respectively, and then terminating together in a triangular fashion,

a continuous endless V-belt stretched between a pair of pulleys and positioned vertically between the center and plane of said vertical angle bars, a top one of said pulleys being connected by brackets to each outer side of said vertical angle bars, respectively, and a lower one of said pulleys being mounted in a U-bracket,

a fastening member from the base of said U-bracket extending through a hole in a lower bracket mounted at midpoint of said crossbar and secured by an adjustable member for adjusting tension on said V-belt,

a rectangular slidable block positioned in said channel formed by said vertical angle bars and connected to the front length of said V-belt, and circumferentially opposite this point is an attached counterbalanced weight,

an angle bracket having vertical and horizontal portions, said vertical portion being attached to the back side of said rectangular slidable block, said horizontal portion being attached to the center and bottom side of a canvas tray saddle block,

a canvas tray holder resting on the top side of said canvas tray saddle block,

an adjustable fastening member extending forward through centers of said vertical portion of said angle bracket and said rectangular slidable block and the vertical plane of said canvas tray holder, respectively, for braking and clamping action between surface of said canvas tray holder against the surfaces of said upright segments, and between the surface of said rectangular slidable block and against the inside channel surfaces formed by said angle bars,

a top canvas holder connected to a top slidable block positioned in said channel formed by said vertical angle bars, said top canvas holder being connected to said top slidable block by a releasable fastening member extending through the center of said top slidable block and forward through the center of said top canvas holder, clamping said top canvas holder to said vertical angle bars at any desired height,

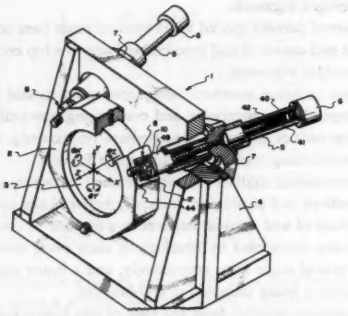
whereby said canvas tray holder will remain in equilibrium at all times, regardless of the weight applied thereon, up to a reasonable limit, without having to add to said fixed counterbalanced weight, and whereby said canvas tray holder can easily be moved to different working heights during the day, giving the artist the opportunity to move from standing to sitting positions at will and without awkward time-consuming mechanical heights adjustments.

5,004,205

HIGH-RANGE AND RESOLUTION DETERMINATE MOUNT AND POSITIONER

Donald G. Brown, Newbury Park, and Andrew F. Onufrak, Canoga Park, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 4, 1990, Ser. No. 533,201
Int. Cl.[5] A47G *1/24*
U.S. Cl. 248—476 **12 Claims**



1. A high range and resolution determinate mount and positioner comprising:

three bipods each with a differential roller screw actuator, each actuator having a stepper motor,

a tube connected to and turned by the stepper motor, the tube having a plurality of grooves on its inside surface,

a shaft having a first threaded portion with a first pitch and a second threaded portion with a second pitch, the shaft having a spline for engaging the grooves in the tube,

a first threaded roller with a first pitch for directly engaging the first threaded portion of the shaft, the first threaded roller fixed to the actuator so that the shaft moves relative to the actuator and the threaded roller remains fixed,

a second threaded roller with a second pitch for directly engaging the second threaded portion of the shaft, the second threaded roller fixed to a roller sleeve, which can move relative to the actuator and provide a linear movement directly proportional to the number of turns of the stepper motor and the relative pitch of the threads on the shaft to form a differential roller screw actuator,

a single-axis flexure attached to each actuator and to a support, and

a two-axis coincident flexure attached to each actuator and to an object to be moved.

5,004,206

VEHICLE SEAT MOUNTING STRUCTURE

Scott Anderson, 26450 SE. Highway 224, Eagle Creek, Oreg. 97022

Filed Jan. 26, 1990, Ser. No. 470,581
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—585 **18 Claims**

1. A vehicle seat mounting structure having front and rear sides, comprising

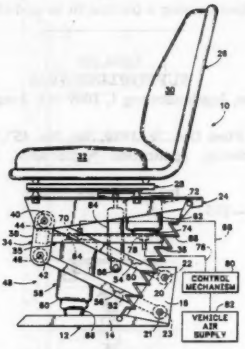
a base frame securable to a vehicle chassis, a seat frame disposed above the base frame for carrying a seat, and a mechanism operatively interposed between said frames for controlling relative motion therebetween to produce downward tilting of the seat with vehicle movement, tending to throw the seat toward the front side of the mounting structure, said mechanism comprising:

a sub frame including a reaction member;

upper and lower elongated link means having one set of the ends pivoted said base frame and another set of ends pivoted on said sub frame;

means connecting said seat frame and said sub frame; and

first and second cushioning means, with one of said cushioning means located between said base frame and said reaction member, and the other of said cushioning means located between said reaction member and seat frame.

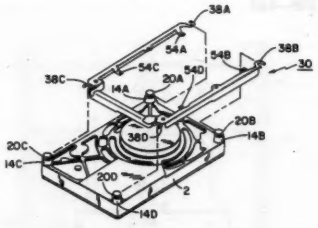


5,004,207

SHOCK MOUNTING STRUCTURE AND MAGNETIC DISK APPARATUS

Jun Ishikawa, Fujisawa, and Kazuhiko Takada, Yamato, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 25, 1989, Ser. No. 427,151
Claims priority, application Japan, Nov. 11, 1988, 63-283759
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—632 **5 Claims**



1. A shock-mounting structure comprising:

a shock absorbing member at least partially consisting of an elastic material with a vibration damping function, having a groove at the side, and being fixed to a vibration-isolated object;

a frame including an elastic frame part, one end which is fixed, and the other end of which is free;

a hook provided on said frame part so that said hook can be fitted into said groove of said shock absorbing member; and

a fixing member mounted to said frame part to fix said frame to said shock absorbing member with said hook being fitted into said grooves of said shock absorbing member.

5,004,208

REMOVABLE RECESS FORMING INSERT

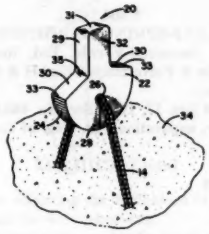
George T. Domizio, 106 Punkup Rd., Oxford, Conn. 06483

Filed Jan. 25, 1990, Ser. No. 469,959
Int. Cl.[5] E04G *15/04*
U.S. Cl. 249—91 **16 Claims**

1. A removable recess forming insert for supporting a hoist-

ing stirrup made of a length of reinforcing bar immersed below the surface level of a wet concrete mixture during curing, and for forming a recess to allow access to said stirrup by a lifting hook after said wet concrete mixture hardens thereby forming a liftable concrete unit, said insert being composed of continuous, solid elastomeric material comprising in combination:

A. a vertically elongated mold body shaped to form said recess for stirrup access having substantially flat front and back surfaces, said front surface being disposed in parallel with said back surface, having a bottom surface extending from said front surface to said back surface, said bottom surface having a curved shape, and incorporating disen-



gageable means for gripping said hoisting stirrup and alternately releasing said stirrup to detach the mold body from the concrete unit after curing, said gripping means having a stirrup eye extending from said front surface to said back surface forming a cylindrical hole therethrough, said hole having an axis substantially parallel to said bottom surface,

B. a mold thumb protruding vertically from said mold body and forming an upstanding griping projection by which said mold body may be seized and disengaged from the concrete unit after curing, and

C. mold shoulders extending inwardly from opposite ends of the bottom surface of said mold body to said mold thumb.

5,004,209

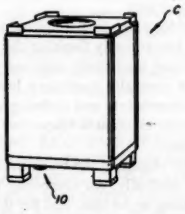
DRY DISCONNECT COUPLING AND SAFETY CAP FOR PORTABLE TANKS

Louis J. Paquette, New Baltimore, Mich., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 365,592, Jun. 13, 1989, abandoned. This application Mar. 9, 1990, Ser. No. 490,922

Int. Cl.[5] F16K *51/00*

U.S. Cl. 251—144 **68 Claims**



1. A dry disconnect coupling for draining fluid from a container, comprising:

fitting means for mounting to the drain of the container;

plug means movably secured in said fitting means and having a first flow position and a second non-flow position;

first coupling means engageable with said fitting means and cooperating with said plug means;

said first coupling means including actuating means for causing said plug means to assume said first flow position or said second non-flow position;

said first coupling means including plug drive means for said plug means;

said plug drive means having a plug engaging and a plug non-engaging position;

said first coupling means including valve means cooperating with said plug drive means;

each of said plug drive means and said valve means including rotating means for causing axial translation of said plug drive means and said valve means relative to said first coupling means and to each other; and

means for permitting said plug drive means to rotate when said valve means is stationary to thereby permit proper alignment and seating of said plug means in said drain when said plug means is moved to said second non-flow position.

5,004,210

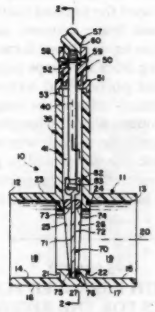
GATE VALVE

Russell J. Sarno, Tarzana, Calif., assignor to Magic Plastics, Burbank, Calif.

Filed Aug. 28, 1989, Ser. No. 400,229

Int. Cl.[5] F16K *3/02*

U.S. Cl. 251—279 **10 Claims**



1. A gate valve comprising:

a unitary molded body having a pair of flow conduits, each having an internal wall defining a flow passage with a central axis, said axes being coincident, a pair of seat mounts between said flow passages, said seat mounts each supporting a respective valve seat, said valve seats facing each other and being spaced apart from one another to form the walls of a groove with a bottom, said valve seats being fully circumferential and each lying in a respective plane, said planes tapering toward each other as they extend across said flow passages, a riser having an actuation axis normal to said central axis, with a plurality of internal walls forming a slide passage extending along said actuator axis;

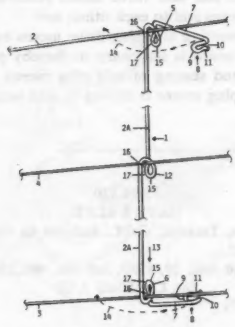
a cap closing said riser and having a shaft passage therethrough;

an actuator rod slidingly and sealingly fitted in said shaft passage, extending along said actuation axis projecting into said slide passage and past said cap;

an imperforate gate having a first and a second face, and a seal on each of said faces, said seals forming a planar line of sealing contact with said seats when fully inserted into said groove, said groove being aligned with said slide passage to enable the gate to be moved into said slide passage to open said valve; and

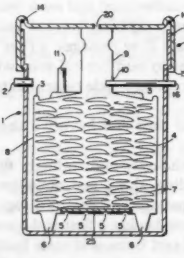
in which said cap and said gate are releasably joinable by latch means which tend to restrain the gate in its most open position until overcome.

5,004,211
FENCE DROPPER
Ernest Rayner, GPO Box 327, Katherine, N.T. 0851, Australia
Filed Aug. 25, 1989, Ser. No. 398,652
Claims priority, application Australia, Aug. 26, 1988, PJ0064
Int. Cl.[5] E04H *17/02*
U.S. Cl. 256—47 7 Claims



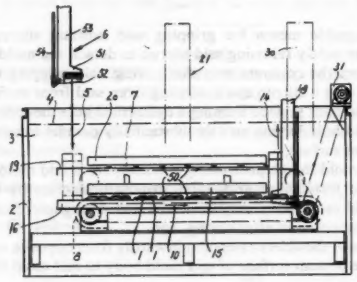
1. A fence dropper formed by bending a length of rod and adapted to engage at least the top and bottom wires of a multi-strand wire fence, said fence dropper comprising a central generally linear portion having loops formed at either end and arm portions extending from the loops parallel to one another laterally of the central portion and terminating at their free ends in wire engagement means, the loops being shaped to engage the top and bottom wires by longitudinal movement of the dropper laterally relative to each wire with the arms orientated at right angles to the wires, and to provide vertical restraint for each wire when the central portion of the dropper is rotated about its own axis until the arms are substantially parallel to the wires.

5,004,212
APPARATUS WITH IMPROVED FLOW-THROUGH CHARACTERISTICS FOR THE RECOVERY OF SILVER FROM SILVER-CONTAINING WASTE FLUIDS
Carlos D. Gutierrez, Spartanburg, S.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Jan. 29, 1990, Ser. No. 471,305
Int. Cl.[5] C22B *3/02*
U.S. Cl. 266—170 8 Claims



1. An improved apparatus for the recovery of silver from waste, silver-containing fluids comprising outer and inner elements, said inner element being insertable and fitable within said outer element so as to provide space between said inner and said outer elements when said inner element is placed within said outer element, and wherein said inner element comprises a necked top mated to a bottom container, said container having at least one foot element located on a bottom portion and having a plurality of holes within said bottom portion to permit fluid to rise from the bottom portion to the necked top, said top having an exit mating means and a gas vent therein, said outer element comprising a top section and a bottom section, said top section having a mating and joining means with said bottom section, and said bottom section having a fluid inlet and a fluid outlet, wherein said outlet connectably joins with said exit mating means in said necked top of said inner element.

5,004,213
LEAF-SPRING HARDENER
Helmut Schulte, Ennepetal-Voerde, Fed. Rep. of Germany, assignor to Luhn & Pulvermacher GmbH & Co., Hagen, Fed. Rep. of Germany
Filed Jan. 17, 1990, Ser. No. 466,029
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1989, 3901752
Int. Cl.[5] C21D *1/62*
U.S. Cl. 266—116 11 Claims



1. In combination with an apparatus for bending leaf-spring blanks, an apparatus for hardening the bent blank and comprising:

a vessel containing a bath of a hot treatment liquid and defining a longitudinal treatment path below a surface of the liquid;

a center guide extending longitudinally along the path in the bath and including at least one normally stationary upper center guide element and spaced therebelow at least one normally stationary lower center guide element defining with the upper center guide element a longitudinally extending center gap;

a pair of side guides extending longitudinally along the path and spacedly horizontally flanking the center guide, each side guide having a normally stationary upper side guide element and a normally stationary lower side guide element spaced therebelow and defining with the respective upper side guide element a respective longitudinally extending side gap;

loading means for engaging the blank in the bending apparatus generally centrally, for removing the engaged blank from the bending apparatus, and for depositing the blank in the bath between the upper and lower guide elements with a center of the blank engaged in the center gap and ends of the blank engaged in the side gaps, whereby the blank is constrained against deforming by engagement with the guide elements; and

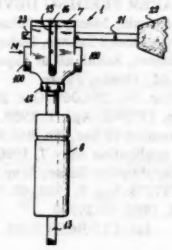
conveyor means including center and side pushers displaceable longitudinally along the respective guides for engaging the blank engaged therein and displacing same along the path through the guides between the upper and lower elements.

5,004,214

DEVICE FOR ADJUSTING THE BACKREST AND/OR THE SEAT OF CHAIRS

Luciano Marchina, Ospitaletto, Italy, assignor to Mara S.R.L., Italy

Filed Sep. 13, 1989, Ser. No. 406,759
Claims priority, application Italy, Sep. 15, 1988, 21878/88[U]
Int. Cl.[5] F16F 5/00
U.S. Cl. 267—64.12 3 Claims



1. A device for adjusting the inclination of the backrest and seat of chairs, said device comprising:

a gas spring comprising an inside valve member, a valve extension member integral thereto, and a valve drive shaft extending from said valve extension member, said gas spring connected at one end to a support for said backrest;

a head comprising a first body portion having a threaded hole therethrough, said valve extension member being threadable into said hole to operatively connect said head to the other end of said gas spring, and said head having a second body portion integral with and adjoining said first body portion, said second body portion having a slot therethrough, said head being connected to said chair seat;

a first pin disposed in said head, said first pin oriented substantially transversely to said slot and said first pin passing through said slot;

a rocker member disposed in said slot and pivotable about said first pin, said rocker member having a first edge along a front surface transverse to said slot and a second edge along a bottom surface transverse to said slot;

a second pin disposed in said head and oriented substantially parallel to said slot and substantially transverse to said first pin;

a rod disposed to be pivotable about said second pin;

a handgrip connected to one end of said rod such that upward movement of said handgrip causes said rod to contact said first edge of said rocker member and to pivot said rocker member about said first pin, causing said second edge of said rocker member to impinge upon said valve drive shaft, thus lowering said shaft to open said inside valve member of said gas spring whereupon said backrest and said seat can be manually repositioned.

5,004,215

RESILIENT RETURN STRUT OF THE ELASTIC-HYDRAULIC TYPE WITH INCORPORATED LINEAR DAMPING BY THROTTLING A HIGH-VISCOSITY FLUID

Jacques A. Aubry, Cabries, and Jean J. Mondet, Vitrolles, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

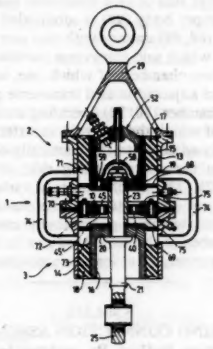
Division of Ser. No. 328,371, Mar. 24, 1989, abandoned. This application May 17, 1990, Ser. No. 525,301
Claims priority, application France, Mar. 24, 1988, 88 03880
Int. Cl.[5] F16F 5/00
U.S. Cl. 267—140.1 52 Claims

1. Resilient return strut of the elastic-hydraulic type with incorporated linear damping, by throttling a hydraulic fluid, intended in particular for a blade of an aerodyne rotor of a rotary-wing aircraft, and comprising:

(a) first and second rigid elements (25, 29), each provided with articulation means (26, 32) for connecting one of said rigid elements to a first part, as a blade or a part-joining said blade to a rotor hub, and the other of said rigid elements to a second part, such as said rotor hub;

(b) a hydraulic damper (1) comprising two damper chambers (34, 35), of inversely variable capacities, said damper chambers being delimited within a tubular body (12) which is unitary with one of said rigid elements (29) and being separated from one another by a transverse partition (10), constituting a piston, said partition being mounted in said tubular body (12) and being unitary with one of said rigid elements (29), and which are filled with a hydraulic fluid intended to flow from one to the other of the damper chambers (34, 35) through at least one narrow connecting passage (39) between these chambers (34, 35) when the rigid elements (25, 29) are displaced one in relation to the other substantially along the general axis (A—A) of the strut, so as to produce a linear damping effect on the relative displacement of the rigid elements (25, 29);

(c) a device (52) for compensation of thermal expansion of the hydraulic fluid, comprising an auxiliary chamber (58) containing a volume of hydraulic fluid, said auxiliary chamber being permanently connected with at least one of



the damper chambers (34) through a damper base (19) which partially delimits the auxiliary chamber (58) and is adjacent to a damper chamber (34);

(d) at least one resilient return device (2 or 3) comprising a sleeve (17 or 18) made of an elastically-deformable material and attached so as to be water-tight by its internal and external lateral surfaces, respectively, between two rigid tubular sections, internal (15 or 16) and external (13 or 14) respectively, each of said tubular sections being substantially coaxial with said general axis (A—A) of the strut and unitary with one of said first and second rigid elements (25, 29), respectively, such that the sleeve (17 or 18) is deformed by shearing when said first and second rigid elements (25, 29) are displaced relative to one another substantially along said general axis (A—A) of the strut, and such that the sleeve (17 or 18) exerts on said rigid elements a resilient return effect tending to return them to an initial relative position, in which arrangement said sleeve (17 or 18) also forms a fluid-tight closure seal sealing the hydraulic damper (1);

(e) wherein the damper chambers (34, 35) are delimited axially between first and second resilient return devices (2, 3) having external rigid tubular sections (13, 14) arranged longitudinally on either side of said tubular damper body (12), said external rigid tubular sections (13, 14) being substantially coaxial one with the other and with said tubular body (12) and being unitary with said tubular body

(12) while constituting a single external tubular armature (4) which is unitary with one (29) of said two rigid elements, and in which arrangement the internal rigid tubular sections (15, 16) of the resilient return devices (2, 3) are substantially coaxial one with the other, are arranged longitudinally while leaving clearance on either side of said transverse partition (10) of the damper (1), and are unitary with one another and with the other rigid device (15), with which said external tubular armature (4) does not form a single piece, while forming a single internal armature (28) comprising a central part (23) which passes axially through the two damper chambers (34, 35) and secures the two internal tubular sections to one another, while being enclosed by the transverse partition (10) which is annular in shape and unitary with one of the armatures (4), and in such a way that said sleeves (17, 18) made of an elastically-deformable material each provide the fluid-tight sealing of one of the two damper chambers (34, 35) respectively, on opposite sides of the transverse partition (10), said narrow connecting passage being a narrow annular passage (39) delimited by radial throttling play between said transverse partition (10) and that one (28) of the armatures with which said transverse partition (10) does not form one piece, and through which the highviscosity hydraulic fluid, which is contained in the damper chambers (34, 35) and in the auxiliary chamber (58), is throttled; and

(f) wherein each of the two damper chambers (34, 35) delimited on either side of said transverse partition (10) in the tubular damper body (12) is subdivided by a rigid transverse wall (68, 69) unitary with that one of the two armatures with which said transverse partition (10) is not unitary, into two chambers of which one, in an internal axial position and adjacent to said transverse partition (10), is a working chamber (70, 72) operating under dynamic pressure, and of which the other, in an external axial position and directly adjacent to the elastically-deformable sleeve (17, 18) on the corresponding side, is a compensation chamber (71, 73) which controls variations in volume resulting from deformations in the elastically-deformable material, and which is permanently connected with the other chamber of the same kind and in the external axial position by means of at least one conduit (74).

5,004,216

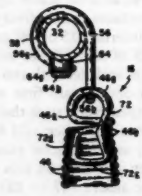
SPRING CONNECTION ASSEMBLY

Robert J. Boudreau, Bedford, Pa., assignor to Hedstrom Corp., Bedford, Pa.

Filed Jan. 5, 1990, Ser. No. 461,229

Int. Cl.[5] F16F *01/12*; A63G *17/00*

U.S. Cl. 267—179 **8 Claims**



1. A spring connection assembly for use in a bouncing toy to connect a seating platform to a support therefor, said assembly including

an elongated support member having a longitudinal axis;

eyelet means rotatably mounted to said support member for free rotation about said member axis;

a coil spring having two ends and an integral spring hook at one end thereof, said hook being hooked to said eyelet means; and

clip means secured to said spring one end, said clip means including a hook portion extending generally parallel to said spring hook, said hook portion being hooked through said eyelet means in the opposite sense from said spring hook.

5,004,217

PAPER FEEDING DEVICE

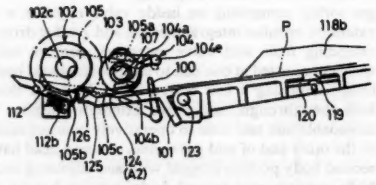
Atsushi Kano, Amagasaki; Masayuki Mizuno, Osaka; Manabu Kajiwara, Takasago; Kenji Sakane, Gojo; Yuji Abe, Hirakata, and Kazuo Nakamura, Sakai, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 264,069, Oct. 28, 1988, which is a division of Ser. No. 177,903, Apr. 1, 1988, Pat. No. 4,813,612, which is a continuation of Ser. No. 866,505, May 23, 1986, abandoned. This application May 7, 1990, Ser. No. 518,323

Claims priority, application Japan, May 24, 1985, 60-112399; May 30, 1985, 60-117175; Sep. 9, 1985, 60-197621; Sep. 10, 1985, 60-139322; Feb. 28, 1986, 61-29950

Int. Cl.[5] B65H *3/06*

U.S. Cl. 271—10 **2 Claims**



1. A document feeding device for an image-forming machine, to feed a document in a document-feeding direction into the image-forming machine from a document tray mounted on the image-forming machine, said document feeding device comprising:

a preliminary feed roller unit;

first mounting means rotatably mounting said preliminary feed roller unit on the image-forming machine adjacent the downstream end of the document tray, with respect to the document-feeding direction, when the document tray is mounted on the image-forming machine, while permitting said preliminary feed roller unit to freely move up and down with respect to the document tray;

a second feed roller unit;

second mounting means rotatably mounting said second feed roller unit on the image-forming machine downstream of said preliminary feed roller unit, with respect to the document feeding direction;

drive means responsive to presence of a stack of one or more documents on the document tray for rotating said preliminary feed roller unit to feed the top document of the stack in the document-feeding direction from the document tray toward said second feed roller unit; and

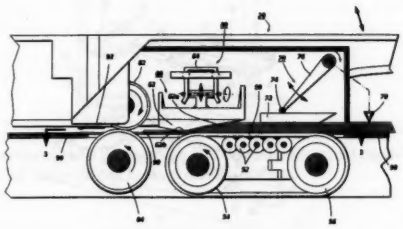
a guide member mounted on the image-forming machine and including means responsive to rotation of said preliminary feed roller unit during feeding of documents from the stack for moving said preliminary feed roller unit up with respect to the document tray, against the downward force of gravity,

whereby upon placement of a stack of one or more documents on the document tray, said preliminary feed roller unit is moved up in a substantially horizontal position and rotated to feed the top document of the stack toward the image-forming machine and into contact with the second feed roller regardless of the height of the stack of documents.

5,004,218
RETARD FEEDER WITH PIVOTAL NUDGER SKI FOR REDUCED SMUDGE

Peter A. Sardano, Fairport, and Irvin J. Kazmierczak, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 6, 1990, Ser. No. 475,493
Int. Cl.[5] B65H *3/04*
U.S. Cl. 271—35 **8 Claims**



1. In a retard type sheet separating and feeding apparatus for separating and sequentially feeding individual sheets of paper or the like from the bottom of a sheet stack in a sheet feeding direction through a sheet feeding path including a retard nip defined by a retard member and an opposing frictional bottom sheet feeding member engaging the bottom of the stack, assisted by a normal force applying member for pressing on the top of the stack with a normal force, the improvement wherein:

said normal force applying member comprises a ski member with a relatively large and substantially planar stack engagement ski area, and a ski pivotal mounting system providing vertical movement of said ski into pressing engagement of said ski area with the top of the stack with a normal force perpendicular said sheet feeding path in response to the loading of a sheet stack into said sheet separating and feeding apparatus,

said ski pivotal mounting system also providing self-adjusting tilting of said ski area about orthogonal axes of movement for self-leveling of said ski area relative to said sheet feeding path to allow said ski to adjust to different stack heights and to maintain adequate total normal force while preventing high pressure concentrations which could increase smearing by providing a large ski area of contact with evenly applied low pressure thereover,

wherein said ski pivotal mounting system includes a pivoted actuating arm, and wherein said normal force applying ski member is mounted to the end of said pivoted actuating arm by a dual axis gimbaled mounting allowing said ski member to freely self-level by said pressing engagement with the top of the sheet stack for uniformly normal distributed application of said normal force thereto.

5,004,219
UP-FEED CONVEYOR SYSTEM

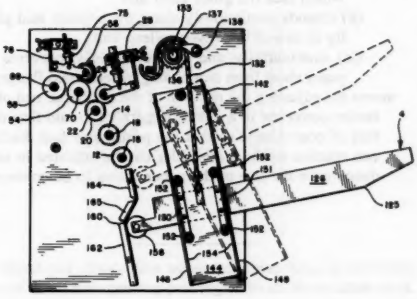
Edward S. Godlewski, 129 Spruce St., Wooddale, Ill. 60191

Continuation of Ser. No. 7,125,923, Nov. 27, 1987. This application Mar. 20, 1989, Ser. No. 325,572
Int. Cl.[5] B65H *3/06*
U.S. Cl. 271—116 **21 Claims**

1. A conveyor system comprising a first conveyor and a second conveyor in feeding relation thereto for feeding stock items positioned on edge in a stack upon said second conveyor and delivering said items sidewise to the first conveyor, said first conveyor comprising a series of sets of rollers said sets being mounted on parallel axes spaced longitudinally of said first conveyor in engagement with the item at the adjacent end of the stack and operative to slough off the end item from the stack and deliver the same to associated pull-out mechanism,

said items having leading and trailing end portions,

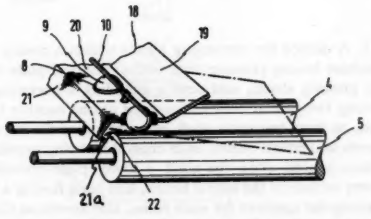
and said rollers comprising means for non-rotationally frictionally engaging and trailing end portion of each successive item as the end item thereahead is being discharged by the first conveyor and thereby exposing the trailing end portion of the next item for engagement with said means to restrain and prevent the end item from dragging the next item to discharge therewith.



5,004,220
METHOD AND APPARATUS FOR CHANGING THE DIRECTION OF SHEET CONVEYANCE

Jürgen Dreschel, Karben; Peter Hö, Oppershofen, and Stephan Mös, Bad Nauheim, all of Fed. Rep. of Germany, assignors to Bell & Howell GmbH, Friedberg, Fed. Rep. of Germany

Continuation of Ser. No. 309,907, Feb. 14, 1989, abandoned, which is a continuation of Ser. No. 201,256, May 25, 1988, abandoned, which is a continuation of Ser. No. 884,449, Jul. 11, 1986, abandoned. This application Sep. 7, 1989, Ser. No. 404,001
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1985, 352040
Int. Cl.[5] B65H *29/00*
U.S. Cl. 271—184 **8 Claims**



1. An apparatus for changing the direction of conveyance of paper sheets traveling between a first processing station and a second processing station, said apparatus comprising:

a feeding conveyor having a discharge end from which paper sheets are fed in a first direction, said discharge end being movable;

a receiving deck upon which the direction of conveyance of paper sheet is changed from said first direction to a second direction, said receiving deck provided with:

(1) a plurality of driven conveyor rollers having apices disposed approximately in the plane of the deck; and

(2) a guide ruler substantially fixed to said receiving deck for laterally guiding a paper sheet at an edge thereof which is a leading edge with respect to said first direc-

tion wherein the axes of the conveying rollers are not at right angles to said second direction, but wherein the axes of the conveying rollers are so inclined that the rollers tend to move the paper in a direction that has a component which is directed toward the guide ruler, and wherein the guide ruler has a flange which

(i) depends below the level of the apices of the rollers proximate those end faces of the conveying rollers which face the guide ruler and

(ii) extends continuously along the beneath said plurality of driven conveyor rollers; and

(iii) continuously and uninterruptedly prevents said paper sheet from descending beneath said flange; and

means for adjusting the position of the discharge end of said feeder conveyor in a direction parallel to said first direction of conveyance so that the position of said discharge end relative to the guide ruler can be adjusted in accordance with the size of the paper sheets to be conveyed.

5,004,221

DEVICE FOR CONVEYING PLATE-LIKE MATTER WITHIN A ROTARY PRINTING MACHINE

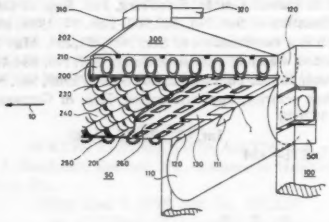
Charles Stark, Prilly, Switzerland, assignor to Bobst SA, Lausanne, Switzerland

Filed Oct. 11, 1989, Ser. No. 419,715

Claims priority, application Switzerland, Oct. 12, 1988, 3807/88

Int. Cl.[5] B65H *29/24*

U.S. Cl. 271—194 **11 Claims**



1. A device for conveying sheets within a rotary printing machine having printing units with cylindrical plate cylinders for printing sheets, said device including a horizontal frame having two lateral beams connected to one another by crossbars, at least one cross shaft being mounted for rotation between said lateral beams, each cross shaft being provided with rollers spaced along the shaft, a lower plate provided on a lower surface of the lateral beams, said plate having a separate rectangular aperture for each roller, said apertures allowing a lower portion of the rollers to extend through the plate and below a lower surface of said plate, means for forming a suction including a collector hood being connected to an upper side of the lateral beams, drive means for rotating each cross shaft, each of said apertures having a size greater than the size of the roller extending therethrough to leave a small gap surrounding each of the rollers, a downstream edge of each aperture of the lower plate being bent toward an axis of the roller, said rollers being positioned with the lower edge forming a plane for engaging an upper surface of a sheet being conveyed through the rotary printing machine and said frame including means for adjusting a vertical position of the rollers relative to an axis of the printing plate cylinder, as required by changes in the thickness of said sheet.

5,004,222

APPARATUS FOR CHANGING THE DIRECTION OF CONVEYING PAPER

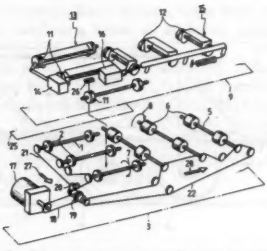
Kenji Dobashi, Saitama, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 193,099, May 12, 1988, abandoned. This application Jun. 12, 1989, Ser. No. 364,151

Claims priority, application Japan, May 13, 1987, 62-114767

Int. Cl.[5] B65H *5/00*

U.S. Cl. 271—225 **4 Claims**



1. An apparatus for changing the direction of paper of varying sizes and thicknesses conveyed therethrough comprising:

a lower guide plate;

first driving rollers for conveying the paper in a first direction so as to pull the paper into said lower guide plate;

second driving rollers for conveying the paper in a second direction perpendicular to the first direction so as to send out the paper from said lower guide plate;

first idle rollers selectively movable into and out of abutting engagement with said first driving rollers to selectively hold the paper between said first idle rollers and said first driving rollers;

second idle rollers selectively movable into and out of abutting engagement with said second driving rollers to selectively hold the paper between said second idle rollers and said driving rollers;

first means for moving said first idle rollers into engagement with said first driving rollers to convey the paper in said first direction;

second means for moving said second idle rollers into engagement with said second driving rollers when said first idle rollers are out of engagement with said first driving rollers to convey the paper in said second direction;

a driving source for generating a driving force; and

a clutch means for selectively communicating said driving force to said first and second driving rollers to rotate the first and second driving rollers simultaneously.

5,004,223

DOCUMENT CONVEYANCE APPARATUS FACILITATING CONVEYANCE BELT REPLACEMENT

Susumu Okui, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Oct. 31, 1989, Ser. No. 429,502

Claims priority, application Japan, Nov. 2, 1988, 63-278751

Int. Cl.[5] B65H *5/02*; B65G *23/44*

U.S. Cl. 271—275 **8 Claims**

4. An apparatus for conveying a document to an exposing surface of a copier and conveying said document from said exposing surface, comprising:

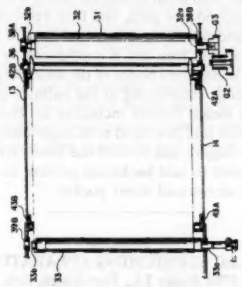
a frame;

a pair of driving rollers, each having an axis of rotation, said driving rollers being rotatably mounted on the frame and supported at each end by the frame, each of said driving rollers being movable in the direction of its axis of rotation to remove one end of each of said driving rollers from said frame;

a positioning member mounted on a corresponding one of

said driving rollers for positioning said corresponding driving roller in the direction of its axis of rotation;

means for driving at least one of said driving rollers; and



a conveyance belt mounted on said driving rollers and capable of being driven by said driving rollers.

5,004,224

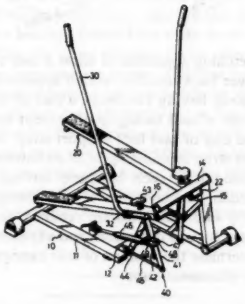
STEPPING EXERCISER

Teresa Wang, 2 Fl., No. 20-1, Alley 6, Lane 670, Ta Ya Rd., Taichung, Taiwan

Filed Jun. 1, 1990, Ser. No. 531,565

Int. Cl.[5] A63B *23/04*

U.S. Cl. 272—70 **1 Claim**



1. A stepping exerciser comprising a frame body; a pair of treadles, a front end thereof being pivoted to a front end of said frame body; a handlebar being substantially vertically coupled to said front end of each said treadle and extending upwards; a rod being fixed to said front end of each said treadle and extending downwards, a lower end of said rods being coupled together by a pair of link rods and a lever, a middle portion of said lever being pivoted to a base of said frame body; and a pair of hydraulic cylinders being substantially laterally coupled between said frame body and said rods; one of said treadles being rotated upwards when an other treadle is depressed downwards by a user so that said user may simulate stepping; a lug being pivotally coupled to a front end of each of said hydraulic cylinders, an opening and a screw hole being formed in each said lug, said rod being slidably received in said opening of said lug; a bolt being rotatably supported on said front end of each said treadle, said bolt being threadedly engaged with said screw hole of a respective lug; and a rotation of said bolt causing said lug to move up and down along said bolt so that the resistance of said hydraulic cylinders can be adjusted.

5,004,225

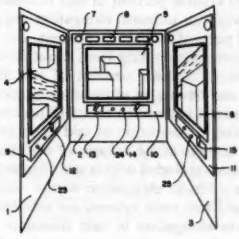
SIMULATED OBSERVATION FLIGHT APPARATUS

Yuri Krukovsky, 43 Saint Marks Pl. #6D, New York, N.Y. 10003

Filed Nov. 1, 1989, Ser. No. 431,733

Int. Cl.[5] H63G *31/16*

U.S. Cl. 272—18 **10 Claims**



1. Simulated observation apparatus comprising an enclosed elevator cabin transporting passengers to an observation deck comprising;

display screen means mounted on at least one wall of the cabin for displaying a changing picture simulating real-life panoramic external views of the cabin;

display storage means for generating a changing picture signal and supplying the picture signal to the display screen means; and,

control means for operating the display storage devices to generate the changing picture during at least one of ascent and descent of the cabin.

5,004,226

APPARATUS FOR EXERCISE OF THE HUMAN BODY

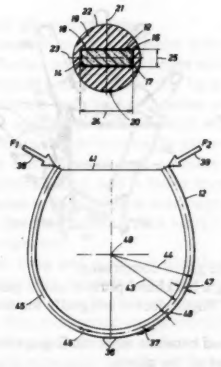
Gordon L. Brown, Jr., Bristol, Tenn., assignor to Morrison Molded Fiber Glass Company, Bristol, Va.

Continuation-in-part of Ser. No. 172,927, Mar. 25, 1988, Pat. No. 4,863,159. This application Jun. 26, 1989, Ser. No. 371,143

The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.

Int. Cl.[5] A63B *21/02*

U.S. Cl. 272—93 **5 Claims**



1. An apparatus for use in the exercise of the human body, said apparatus comprising:

filament matrix means of a selected length having a neutral axis defined therethrough, said filament matrix means having an oblong cross-section with a major axis of a

selected width and a minor axis of a selected height defined therethrough, wherein the width of the cross-section is from 2–7 times the height, said filament matrix means having;

two ends,

filaments, a portion of said filaments being oriented at an angle of less than 3 degrees from said neutral axis, a portion of said filaments containing glass fibers, said filaments constituting from about 35 volume percent to about 70 volume percent of said filament matrix means and having an ultimate elongation design value from about 2 percent to about 6 percent, and

a resin system constituting from about 30 volume percent to about 65 volume percent of said filament matrix means, and having an ultimate elongation design value from about 4 percent to about 12 percent, wherein the length and cross-section of said filament matrix means, and percentage of the volume of said filaments and said resin system included within said filament matrix means, and the ultimate elongation design value of said filaments and said resin system, are selected such that the maximum elongation in said filaments and said resin system, when the distance separating the ends of the filament matrix means is minimized by the application of force to said two ends, is less than the ultimate elongation design value of said filaments and said resin system,

an outer protective sheath formed from an elastomeric material attached to said filament matrix means along the length thereof and having an outer circular cross-section and two ends terminating proximate said ends of said filament matrix means,

two hand grips, one hand grip defined about each end of said outer protective sheath and positioned parallel to said neutral axis, and

hand retention means operatively connected to one end of each of said hand grips, said hand retention means sized to allow the passage of a hand therethrough.

5,004,227

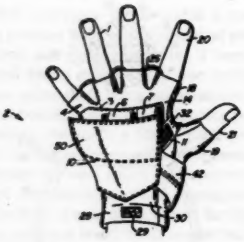
EXERCISE APPARATUS

Ned Hoffman, Berkeley, Calif., assignor to Sports-Mitt International, Berkeley, Calif.

Continuation-in-part of Ser. No. 289,191, Dec. 23, 1988, Pat. No. 4,923,418. This application Aug. 25, 1989, Ser. No. 398,360

Int. Cl.[5] A63B *21/065*

U.S. Cl. 272—119 **18 Claims**



1. An exercise glove comprising:

a mitt having a backhand portion and a palm portion;

a plurality of finger sleeves integrally formed with said mitt; and

a loop disposed between adjacent finger sleeves for facilitating removal of the glove,

said loop extending axially with respect to said adjacent finger sleeves.

3. An exercise apparatus for retaining a weight on a user's hand comprising:

a support having a backhand portion:

an insert pocket disposed on said backhand portion; for receiving the weight;

a strap means mounted across said insert pocket for removably securing the weight within said insert pocket to the user's hand, said strap means including a first band having first and second free ends, said first free end configured to wrap around the user's metacarpal bone of the little finger and said second free end is configured to wrap between the user's metacarpal bones of the index finger and thumb, said free ends converging at the palm of the user's hand, said strap means further including an auxiliary band extending from said first band at an angle thereto, away from the user's fingers and toward the user's wrist; and

means mounted to said backhand portion for retaining said first band across said insert pocket.

5,004,228

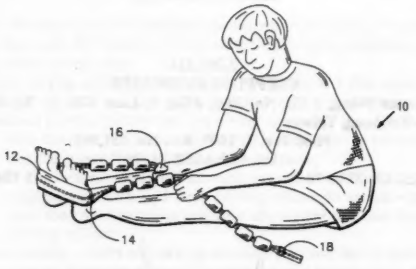
LEG STRETCHING APPARATUS

Scott Powers, 5704 Euper La., Fort Smith, Ark. 72903

Filed Apr. 20, 1989, Ser. No. 341,432

Int. Cl.[5] A63B *21/00*

U.S. Cl. 272—125 **5 Claims**



1. A leg stretching apparatus to allow a user to stretch hamstring and lower back muscles, which apparatus comprises: a foot support strap having two ends; a pair of handgrip placement straps, one of said handgrip placement straps extending from each said end of said foot support strap, and each handgrip placement strap terminating in an adjustable clip means; a plurality of handgrips, each handgrip having a hole therethrough to slidably receive one of said handgrip placement straps, whereby said handgrips are retained on said handgrip placement straps by said clip means and adjustment of said clip means will determine the position of said handgrips along each said handgrip placement strap.

5,004,229

PORTABLE EXERCISE DEVICE

Charles F. Lind, 2210 E. Sherwood Rd., Arlington Hts., Ill. 60004

Filed Nov. 3, 1988, Ser. No. 266,642

Int. Cl.[5] A63B *21/00*

U.S. Cl. 272—127 **8 Claims**

1. An exercise device, comprising the combination of

a substantially unitary cross member;

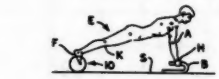
a pair of wheels, and means rotatably connecting the wheels to the cross member adjacent its opposite ends, for rotation about an axis extended between the cross member ends, said wheels holding the cross member above a support surface in an unstable rotatable manner;

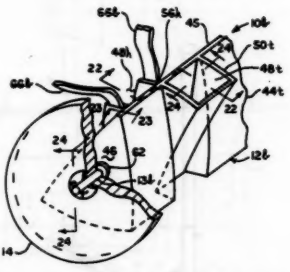
said cross member having first and second alternate pairs of separate feet-holding forms thereon, each pair of feet-holding forms being laterally spaced apart and between the wheels, and having transverse walls disposed between an imaginary cylinder defined between the wheel peripheries and the wheel axis and engaged below the wheel axis

by the exerciser's feet to vertically support them on the cross member above the support surface;

each of said first pair of feet-holding forms also having walls extended upwardly aways from its transverse support wall and being open upwardly effective in modes of exercise with the exerciser generally facing toward the support surface to receive the toe-ends of the exerciser's feet and firmly hold them to the cross member and stablize the cross member on its wheeled support; and

each of said second pair of feet-holding forms also having walls extended upwardly away from its transverse support wall and being open upwardly and rearwardly effective in





modes of exercise with the execises generally facing away from the support surface to receive the heel-ends of the exerciser's feet and firmly hold them to the cross member and stabilize the cross member on its wheeled support;

whereby the exerciser can assume different bridged positions each generally having his/her hands on the support surface and his/her feet alternatively in the first or second pair of feet-holding forms of the exercise device, and whereby the exerciser can modify the bridged positions by moving at the waist, hips, knees, elbows and/or shoulders, with the hands being stationary or moving along the support surface and the exercise device moving along the support surface.

5,004,230

METHOD AND APPARATUS FOR EXERCISING OR TESTING ROTARY TORSO MUSCLES

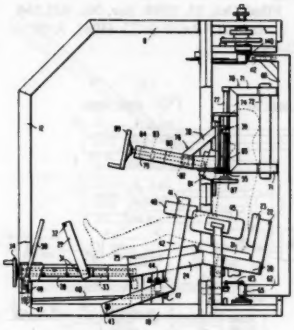
Arthur Jones, 1155 NE. 77th St., Ocala, Fla. 32670

Continuation-in-part of Ser. No. 361,055, Jun. 5, 1989, and a continuation-in-part of Ser. No. 307,706, Feb. 8, 1989, and a continuation-in-part of Ser. No. 307,473, Feb. 8, 1989, and a continuation-in-part of Ser. No. 236,367, Aug. 25, 1988, Pat. No.

Int. Cl.[5] A63B *21/00*

U.S. Cl. 272—134 **17 Claims**

1. Apparatus for testing and/or exercising rotary muscles of a portion of the human body, the apparatus comprising in combination, a seat for receiving a subject in seated position, a movement arm rotatable about a generally vertical axis in response to forces generated by said muscles, means on the movement arm for securing the upper torso of the subject to the movement arm against movement relative to the movement arm, and resistance means connected to the movement arm for opposing rotation of the movement arm in one direction in response to forces generated by said rotary muscles and wherein said means for securing the upper torso includes at least one pad engageable with the chest area of the subject, a



backrest engageable by the upper back of the subject and a headrest engageable by the head of the subject.

5,004,231

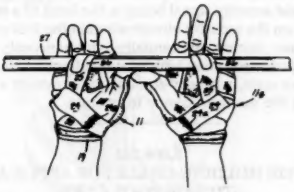
EXERCISE GLOVE

Don Alread, 11960 SW. 12th St., Pembroke Pines, Fla. 33025

Filed Feb. 26, 1990, Ser. No. 485,032

Int. Cl.[5] A63B *21/00*

U.S. Cl. 272—143 **8 Claims**



1. An exercise glove comprising,

a back web surface overlying a palm web surface wherein the glove further includes four finger sockets and a thumb socket integrally mounted to the back and palm web surfaces wherein each socket includes a through-extending aligned opening directed through each of the sockets to an interior cavity defined by the glove wherein each of the thumb and finger sockets includes a free forward annular terminal edge, and a lower terminal end of the glove includes a discontinuous wrist engaging edge with a split web directed into the back surface from the wrist engaging edge, and

a first flexible strap and a second flexible strap selectively securable together overlying the split web wherein each first and second strap include engagement means for securing the first and second straps together, and

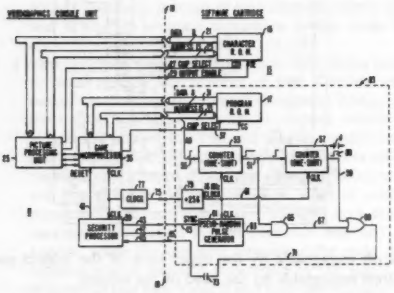
further including a loop strap defining a loop diagonally overlying the palm web surface and terminating medially thereof and secured at its lower terminal end to a rear terminal end of the second strap, and an elongate flexible strap directed through the loop and secured at its rear terminal end to a rear terminal end of the first flexible strap.

5,004,232

COMPUTER GAME CARTRIDGE SECURITY CIRCUIT

John J. Wong, Atherton, and Paul S. Lui, Sunnyvale, both of Calif., assignors to Macronix, Inc., San Jose, Calif.

Filed Oct. 13, 1989, Ser. No. 421,164
Int. Cl.[5] A63F 9/22; H04L 9/00
U.S. Cl. 273—435 18 Claims



14. A method of activating a computer video game system to function with a game memory cartridge wherein the computer system including a microprocessor operating upon initialization by holding the microprocessor in a inactive state for a time and then to cycle it between inactive and active states until the cartridge communicates a proper security signal to the computer system over a security circuit, comprising the following steps occurring in the cartridge:

recognizing when the computer system microprocessor is inactive or active,

holding a security signal from the cartridge inactive while the computer system microprocessor is sensed to be inactive, and

generating a security signal on said security circuit when the computer system microprocessor is recognized to be active, said security signal being in the form of a sequence of pulses on the security circuit wherein the first pulse of the sequence occurs substantially simultaneously with the microprocessor switching to its said active state from its inactive state, whereby the computer system reset signal allows the microprocessor to operate.

5,004,233

DEVICE FOR HOLDING CHALK FOR APPLICATION TO TIPS OF POOL CUES

Donnie C. Phillips, Rte. 1, Honea Path, S.C. 29654

Filed Feb. 23, 1990, Ser. No. 484,178
Int. Cl.[5] A63B 71/00
U.S. Cl. 273—21 16 Claims

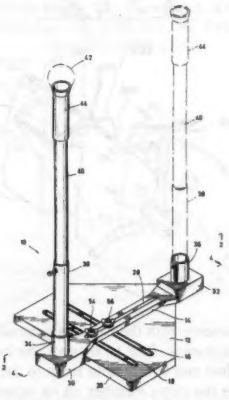
1. An improved device for holding chalk for application to pool cues comprising an elongated housing, said housing having a plurality of spaced apart walls, one of said walls defining an elongated opening therealong, said opening extending substantially the length of said housing and being adequate in size to permit passage of a tip of a pool cue therethrough along the length of same, said housing defining a chamber within said walls for receipt of a plurality of cubes of cue chalk therein, each said cube being exposed behind said opening for contact with a cue tip passing therethrough, said chamber extending at least a major portion of the length of said housing, means for locking said chalk cubes within said housing against removal, and means for mounting said device on a surface to present said chalk behind said opening for application of said chalk to a cue stick.

5,004,234

ADJUSTABLE BATTING TEE

Ray A. Hollis, 6715 Greenvale La., Houston, Tex. 77066

Filed Jun. 6, 1990, Ser. No. 534,030
Int. Cl.[5] A63B 69/40
U.S. Cl. 273—26 R 2 Claims



1. An adjustable batting tee, comprising:

a home plate having first and second open slots, said slots being parallel and spaced apart:

a horizontal support member of a given length and having first and second ends and also having a first pedestal at one of its said ends and having a third open slot along at least a portion of the length of said horizontal support member, said first pedestal having means to mount a batting tee thereto;

first and second fastener means connecting said horizontal support member to said home plate, the first said fastener means being in said first slot, the second said fastener means being in said second slot, and each of said first and second fastener means being in said third slot, whereby upon loosening said first and second fastener means, said first pedestal can be re-positioned with respect to said home plate.

5,004,235

SURFACE UNIT ON PERIPHERAL WALL OF TENNIS COURT FIELD

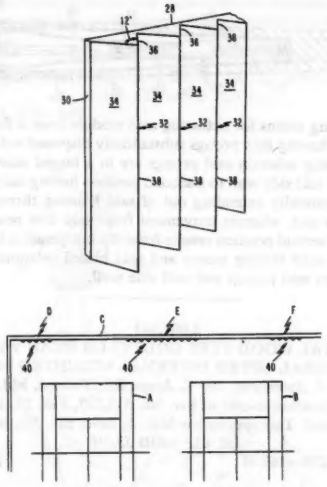
Tamio Suga, 8-99, Tokiwa Muranouchicho, Ukyo-ku, Kyoto-shi, Kyoto, 615, Japan

PCT No. PCT/JP88/00017, § 371 Date Dec. 6, 1988, § 102(e) Date Dec. 6, 1988, PCT Pub. No. WO89/06151, PCT Pub. Date Jul. 13, 1989
PCT Filed Jan. 8, 1988, Ser. No. 283,328
Int. Cl.[5] A63B 61/00
U.S. Cl. 273—29 A 10 Claims

1. A surface unit for controllably repelling a tennis ball in a rebound-reducing manner, supported at a substantially vertical wall at the periphery of a tennis court, comprising:

a plurality of elongate ball-repelling members comprising a

ball rebound-reducing material, said repelling members each being triangular in cross-section and attached to extend vertically in parallel on said surface of said peripheral wall, each member having a base attached to said wall and a vertical ridge line formed at the intersection of two planar ball-repelling sides extending from said base; and



said repelling members further being attached to said wall such that the distance between said ridge lines of adjacent repelling members are equal to the diameter of a tennis ball.

5,004,236

BALANCE SHAFT

Makoto Kameshima, 11-17 Miyagidai 2-chome, Funashi-shi, Chiba-pref., Japan

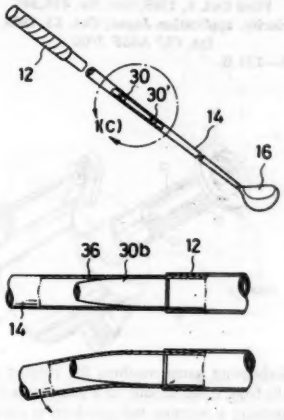
Continuation of Ser. No. 31,126, Mar. 30, 1987. This application Aug. 16, 1988, Ser. No. 233,846

Claims priority, application Japan, Apr. 2, 1986, 61-76286; Sep. 5, 1986, 61-207738

Int. Cl.[5] A63B *53/00*

U.S. Cl. 273—80 B **5 Claims**

1. A golf club, comprising a balance shaft having a first and a second end, a club head attached to the first end and a grip attached to the second end, said balance shaft comprising a hollow tubular club-shaft having an inner diameter, and at least one substantially cylindrical member within the club-shaft, each of said at least one cylindrical member having a tapered surface so as to form a large-diameter portion and a small-diameter end, only the large-diameter portion being fixed to the club-shaft, the small-diameter end having a diameter smaller than the inner diameter of the club-shaft and being located closer to the first end than is said large-diameter portion; so that, when said hollow tubular club-shaft bends during operation an inner surface of said tubular club-shaft contacts



said tapered surface of said at least one cylindrical member to control the whippiness of said golf club.

5,004,237

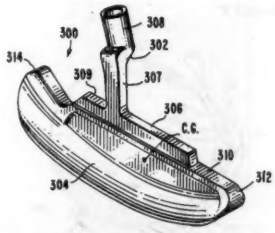
PUTTER WITH L-SHAPED HOSEL

Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204

Filed Jun. 9, 1989, Ser. No. 364,085

Int. Cl.[5] A63B *53/02*

U.S. Cl. 273—80.2 **7 Claims**



1. A putter type golf club head having a shaft connecting means and a club head including a heel, toe, ball striking face and top ridge, wherein the improvement comprises:

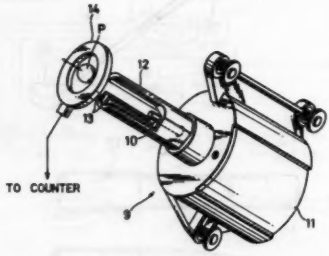
a hosel for connecting said club head body to said shaft connecting means; said hosel including a vertical hosel member connected to said shaft connecting means and a horizontal hosel member connected and perpendicular to said vertical hosel member whereby 90 degree angle between said horizontal and vertical hosel members is formed; said horizontal hosel member lying above said top ridge and having an upper surface unattached to said club head body and a lower surface integrally formed with and attached to said top ridge of said club head body and providing an extended connection between said hosel and said club head body in the heel-to-toe direction of the club head; said horizontal hosel member being comprising a first component extending from said vertical hosel member toward said toe and a second component extending from said vertical hosel member toward said heel.

5,004,238

BALL-SHOOTING GAME MACHINE

Kazuo Okada, Tokyo, Japan, assignor to Universal Company, Ltd., Japan

Filed Oct. 6, 1989, Ser. No. 418,346
Claims priority, application Japan, Oct. 13, 1988, 63-258159
Int. Cl.[5] A63F 7/00
U.S. Cl. 273—121 B 9 Claims



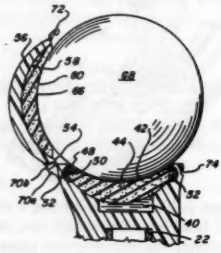
1. A ball-shooting game machine for playing a game by shooting balls from a ball shooter to a game zone over a game board, comprising a winning ball production control, a shot ball detection means for providing an output signal every time a predetermined number of balls is shot from said ball shooter, means for generating a random number in response to said output signal from said shot ball detection means and means for activating said winning ball production control to effect an advantageous state to a player depending upon the random number generated.

5,004,239

GOLF CLUB AND GOLF BALL CLEANING DEVICE

Rick L. Wettstein, 10909 W. 65th Way, Arvada, Colo. 80004

Filed Feb. 14, 1990, Ser. No. 479,937
Int. Cl.[5] A46B 15/00; A63B 53/00, 57/00
U.S. Cl. 273—162 F 11 Claims



9. A device for cleaning golf balls comprising in combination a golf club having a shaft with a head at one end, a grip at the opposite end, and further including a concave recess formed in said opposite end, said recess containing means for absorbing moisture thereby forming a golf ball cleaning surface incorporated into said grip.

5,004,240

GOLF BALL RETRIEVER

Jack K. Tsukamoto, 1976 Paula Dr., Honolulu, Hi. 96816

Filed Apr. 18, 1990, Ser. No. 510,559
Int. Cl.[5] A63B 53/00, 53/14
U.S. Cl. 273—162 E 15 Claims

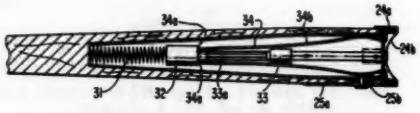
1. A retrofittable module for use with a golf club to retrieve golf balls, said retrofittable module comprising:

an elongated housing having a side wall, a closed end, and an open end;

a plurality of curved, resilient prongs;

connecting means for connecting said prongs together;

axial biasing means contacting said housing for biasing said prongs in an axial direction parallel to the longitudinal axis of the housing toward said open end; and



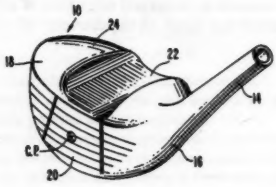
actuating means for actuating said module from a first position having said prongs substantially disposed within said housing wherein said prongs are in a biased relationship with said side wall to a second position having said prongs substantially extending out of said housing through said open end, wherein movement from said first position to said second position results from the cooperation between said axial biasing means and said biased relationship between said prongs and said side wall.

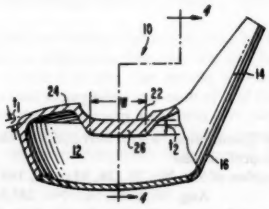
5,004,241

METAL WOOD TYPE GOLF CLUB HEAD WITH INTEGRAL UPPER INTERNAL WEIGHTED MASS

Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204

Continuation-in-part of Ser. No. 311,737, Feb. 17, 1989, abandoned. This application Mar. 5, 1990, Ser. No. 489,253
Int. Cl.[5] A63B 53/04
U.S. Cl. 273—167 H 7 Claims





1. A metal wood type golf club head formed of a hollow interior metal shell having inner and outer wall surfaces and a first wall thickness, said club head including a hosel, heel, toe, upper surface, rear surface, ball striking face with a center of percussion thereon wherein the improvement comprises:

an elongated mass integrally formed with said inner wall surface and under said upper surface and extending beyond said inner wall surface into the interior of said metal shell, said elongated mass located between a point adjacent said ball striking face and a second point adjacent said rear surface in a front to rear direction; said elongated means and said metal shell having a second thickness at least twice the thickness of said first wall thickness, said elongated mass centrally disposed relative to the ball striking face between said heel and said toe;

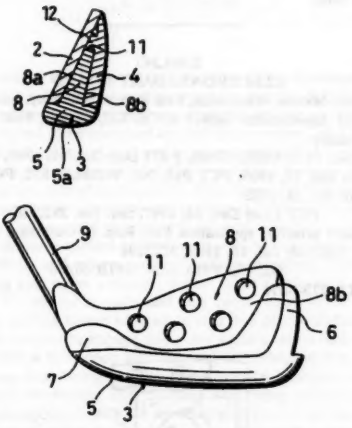
said elongated mass positioning the center of gravity of said club head in a direction toward said upper surface and above and behind said center of percussion on said ball striking face.

5,004,242

IRON GOLF CLUB HEAD AND METHOD OF PRODUCING THE SAME

Takeshi Iwanaga, Kobe, and Akio Ohnishi, Kakogawa, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed Apr. 25, 1990, Ser. No. 514,309
Claims priority, application Japan, Jun. 12, 1989, 1-149230
Int. Cl.[5] A63B *53/04*
U.S. Cl. 273—169 **9 Claims**



1. An iron golf club head comprising:

a core member made of a metallic material having a large specific weight, said core member having an exposed integral sole portion, an integral riser wall portion, and an integral shaft connecting portion, said riser wall portion being formed with at least one through-hole extending between front and rear surfaces thereof;

a composite striking face member fixed to said front surface of said riser wall portion, said, striking face member having a specific weight smaller than that of said core member;

a cladding made of a lightweight metal, said cladding covering all surfaces of said riser wall portion and said shaft connecting portion except for a surface portion of said riser wall portion on which said striking face member is fixed, said cladding having at least one integral projection fitting into said through-hole for connection to said striking face member.

5,004,243

GOLF PRACTICE APPARATUS

Stephen J. Diouhy, 101 Seven Oaks Road, Council Bluffs, Iowa 51503

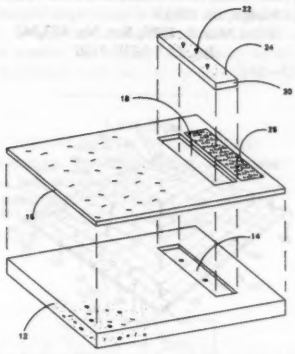
Filed Oct. 16, 1989, Ser. No. 422,041
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—195 A **14 Claims**

1. A golf practice apparatus for use on a rigid support base having a cavity formed therein comprising,

a mat,

a tee pad having upper and lower surfaces and a thickness generally equal to the depth of said support base cavity plus the thickness of said mat,

said tee pad being operative to be penetrated at numerous positions on said upper surface by a golf tee to any selective depth for removably receiving and supporting said tee, and



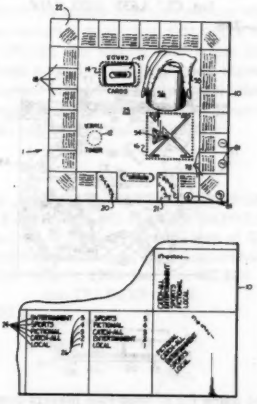
said tee being adapted for placement adjacent said mat whereby a ball on a tee supported by said pad is positioned to be struck by a club of a golfer on said mat.

5,004,244

MEMORY GAME

Gary K. Johnson, 10701 W. 71st Pl., Shawnee, Kans. 66203

Filed Aug. 20, 1990, Ser. No. 570,605
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—240 **10 Claims**



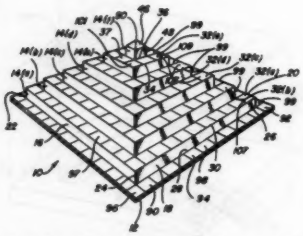
9. A method of playing a memory development game by one or more players, comprising the steps of: (a) first randomly selecting a sliding scale of values for certain people categories and randomly selecting a plurality of pairs of alphabetic characters; (b) then competitively recording the names of known persons, each of whom have initials matching one pair of said plurality of pairs of alphabetic characters during a given interval of time; and (c) then totaling the score of each player by summing the values of each of the recorded names as respectively indicated by the selected values for the appropriate people categories.

5,004,245

METHOD AND APPARATUS FOR PLAYING A GAME

Dean P. Schumacher, 4922 Stamford Dr., West Bloomfield, Mich. 48033; William F. Blume, 26 Gramercy Park South, Apt. 9F, New York, N.Y. 10003, and John C. Bonds, 730 N. LaSalle, Chicago, Ill. 60610

Filed Mar. 1, 1990, Ser. No. 487,345
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—241 15 Claims



1. A method for playing a game, said game having a game board, a plurality of game players, and a plurality of tokens associated therewith, said method comprising the steps of:

(a) defining a plurality of hand symbols;

(b) causing two of said plurality of game players to generate one of said plurality of hand symbols; and

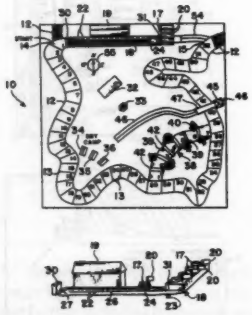
(c) selecting said one of said plurality of tokens to be moved by comparing said hand symbols formed by said first and second plurality of game players.

5,004,246

INTERNATIONAL WHITE-WATER RAFTING GAME

Frances S. Merrill, 214 Archers Mead, Williamsburg, Va. 23185; Richard L. Miller, and Patricia M. Miller, both of Rte. 3, Box 1063, Hayes, Va. 23072

Filed Sep. 4, 1990, Ser. No. 576,785
Int. Cl.[5] A63F *3/00, 9/14*
U.S. Cl. 273—246 14 Claims



8. A board game for at least two players comprising:

a game board having a simulated waterway graphically displayed thereon and divided into a plurality of spaces by a plurality of spaced lines;

said waterway simulating a fast flowing stream having a bowman push-off start space and a pick-up finish line space and including graphic illustrations of white water rapids, water falls, and other hazards;

a plurality of water raft game pieces manually movable along the waterway and positionable in the spaces formed by said plurality of lines;

an equipment lodge and a ready ramp area on said game board for said plurality of game pieces;

a miniature flag representing a nation of the world releasably carried by each said water raft game piece;

means effecting gravity launch of each game piece includes a miniature railroad segment having an incline portion terminating adjacent said bowman push-off start space, a flat car disposed and movable on said railroad segment, a barrier positioned between said bowman push-off start space and said railroad segment to stop movement of said flat car at that point, whereby when a water raft game piece is transported by said flat car and said flat car is stopped by said barrier, the momentum of said game piece carried by said flat car will cause said game piece to be gravity launched over said barrier and onto said game board at the bowman push-off start space, and,

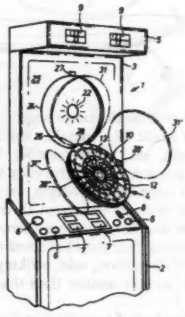
means operable by each player determining the number of spaces on said waterway his game piece may be moved at a time.

5,004,247

ELECTRONIC DART BOARD

Wilhelm Menke, Wiesbaden, Fed. Rep. of Germany, assignor to NSM Apparatebau GmbH & Co. KG, Bingen, Fed. Rep. of Germany

PCT No. PCT/DE87/00608, § 371 Date Jul. 19, 1989, § 102(e) Date Jul. 19, 1989, PCT Pub. No. WO88/05521, PCT Pub. Date Jul. 28, 1988
PCT Filed Dec. 24, 1987, Ser. No. 392,925
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1987, 3702135; Jul. 15, 1987, 3723298
Int. Cl.[5] F41J *5/04;* A47B *88/00*
U.S. Cl. 273—376 14 Claims



1. In a dart game including a dart target disk attached in an opening in the front wall of a housing, with said dart target disk including movable segments which are assigned different numbers of points and are provided with holes to receive the darts so as to actuate, by way of an elastic support, a group of switches disposed between said support and a carrier plate when a dart strikes a segment, permitting by way of electrical and/or electronic components automatic recording, counting and display of the points earned, the improvement comprising:

a first support means for supporting a unit on said dart target disk, said unit including said elastic support, said group of switches, and said carrier plate;

a second support means for supporting said dart target disk on said front wall;

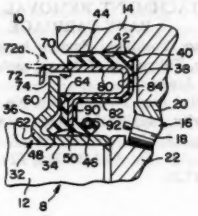
said dart target disk together with said unit being pivotable about said second support means for movement between a generally vertical position and a position in which said dart target disk and unit extend outwardly relative to the front wall and thereafter said unit being pivotable about said first support means to an unfolded position in which said unit is unfolded away from the dart target disk.

5,004,248

UNITIZED SEAL WITH UNITIZING JOINT REMOTE FROM SEAL LIP

Edward J. Messenger, and George Fedorovich, both of Longview, Tex., assignors to Garlock Inc., Palmyra, N.Y.

Filed Aug. 25, 1983, Ser. No. 526,285
Int. Cl.[5] F16J *15/34*
U.S. Cl. 277—37 **26 Claims**



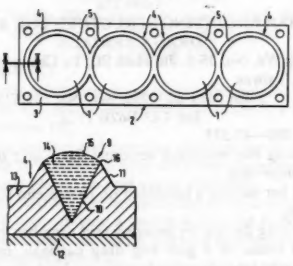
1. A unitized seal for providing a sealing action between first and second relatively movable members which includes no more than two unitary stampings, comprising a one piece wear sleeve adapted to be mounted on said first member, said wear sleeve including one of said unitary stampings which includes a first section having a wear surface provided thereon and a second section extending angularly away from said first section and terminating at a terminal end portion radially spaced from said wear surface, said terminal end portion including an inner surface, an outer surface extending in spaced relation to said inner surface, and a terminal end surface extending between said inner and outer surfaces, a one piece reinforcing shell adapted for assembly with said one piece wear sleeve and including sealing means secured to said one piece reinforcing shell and adapted to engage said wear surface when said reinforcing shell is assembled with said one piece wear sleeve, said reinforcing shell being the remaining unitary stamping and a part of said reinforcing shell forming a unitizing rollover portion for engagement with the terminal end portion of the second section of said wear sleeve to form therewith a unitizing joint remote from said wear surface, said rollover portion extending above and over said terminal end surface and along the outer surface of said terminal end portion, when said reinforcing shell is operatively assembled with said wear sleeve.

5,004,249

FLAT GASKET AND PROCESS FOR ITS PRODUCTION

Peter Grosch, Finningen; Gerhard Haas, Munich, and Ingo Kremer, Senden, all of Fed. Rep. of Germany, assignors to Reinz-Dichtunga-Gesellschaft mbH, Neu-Ulm, Fed. Rep. of Germany

Filed Feb. 10, 1989, Ser. No. 308,522
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1988, 3804436
Int. Cl.[5] F02F *11/00;* **F16J** *15/00;* **B23P** *15/06*
U.S. Cl. 277—207 R **14 Claims**



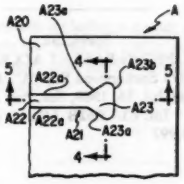
1. A flat gasket, with at least one through opening, which is provided with a metallic border resting on a rim of the opening, the border having a U-shaped cross-section with opposing legs, wherein at least one of the legs (5,6) of the border (4) is provided at least zonally on its outer surface with a structure having at least one depression containing an impregnating agent solution said depression being formed with a shape and level difference such that in the unloaded state and as a result of its surface tension, the impregnating agent solution (14) is kept in the depression with outwardly curved meniscus (15).

5,004,250

METAL PLATE WITH A BEAD

Tsunekazu Udagawa, Ichikawa, Japan, assignor to Ishikawa Gasket Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1990, Ser. No. 496,997
Int. Cl.[5] F16J *15/00;* **F16K** *41/00*
U.S. Cl. 277—236 **5 Claims**



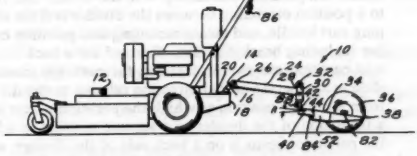
1. A metal plate for a gasket, comprising,
an elastic plate with an outer surface, and
at least one bead formed on the elastic plate, said bead having a bead body to provide surface pressure thereat and a bead end portion terminated inside the elastic plate, said bead body projecting outwardly relative to the elastic plate and having first side edges to define a width of the bead body therebetween, said width of the bead body being substantially constant so that the bead body with the constant width extends for a predetermined distance inside the elastic plate, said bead end portion having second side edges connected to the first side edges, respectively, distance between the second side edges increasing as distance from an end of the bead body increases so that surface pressure at the bead end portion, when the metal plate is compressed, can gradually decrease as it approaches an end of the bead end portion.

5,004,251

SULKY APPARATUS ATTACHABLE TO A SELF-PROPELLED POWER MOWER

James D. Velke, and William R. Wright, both of Gaithersburg, Md., assignors to Lawn-Wright, Inc., Gaithersburg, Md.

Filed Mar. 1, 1990, Ser. No. 487,156
Int. Cl.[5] B62D *63/00*
U.S. Cl. 280—32.7 **18 Claims**



1. Sulky apparatus attachable to a self-propelled vehicle, such as a power mower, for transporting an operator, said apparatus comprising:
hinge means, defining a first pivot axis for attachment to said

mower with said first axis in a normally substantially horizontal position;

a first rigid arm, defining first and second ends, said first end connected to said hinge means for substantially pivotal movement about said first axis;

pivot means attached to said second end of said arm, said pivot means defining a second normally substantially vertical pivot axis;

operator supporting means attached to and in operative relationship with said pivot means for freely rotating substantially horizontally about said second axis;

a wheel rotatably mounted on said operator supporting means;

said pivot means enabling unlimited movement of said supporting means and said wheel completely about said pivot axis; and

said wheel and said supporting means of predetermined sizes normally to permit free movement of said wheel and said supporting means beneath said arm as said supporting means and said wheel rotate about said second axis and past said arm.

5,004,252

SHOPPING BASKET ACCESSORY

Wayne Kraper, 775 Springwood St., "A", Corona, Calif. 91720

Filed Jul. 24, 1989, Ser. No. 383,640

Int. Cl.[5] B62B *3/02, 5/00*

U.S. Cl. 280—33.992 **6 Claims**

1. A shopping basket accessory comprising:

partition means for covering a bin area of a conventional shopping cart and for providing a solid writing surface proximate a handle on said conventional shopping cart, said partition means comprising a depending member disposed on a forward edge thereof and shaped for partially encircling a basket wire proximate said handle;

means, mounting said partition means to a movable, generally vertical divider disposed within said conventional shopping cart, for enabling said partition means to be stored in a parallel relationship with the divider and lifted to a position extending between the divider and the shopping cart handle, said means mounting said partition member including bracket means, disposed on a back side of said partition means, for enabling the partition means to slide in a general vertical direction relative to the divider from a storage position at which the partition means is on a front side of the divider to a storage position at which the partition means is on a back side of the divider; and

latch means for temporarily locking said partition means between the divider and the handle in order to provide a secure bin proximate said handle for temporary storage of a purse, said latch means comprising a tab slidably mounted to said depending member and extending therethrough, said tab having a lower portion shaped for partially encircling said basket wire proximate said handle when the tab is slid to a locked position and upper portion means, accessible from a top side of said depending means, for enabling sliding of said lower portion into the locked position.

5,004,253

GUARD ATTACHMENT/REMOVAL STRUCTURE IN BABY CARRIAGE

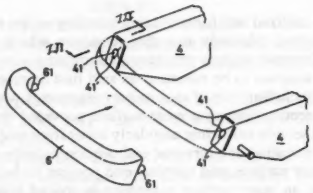
Shinroku Nakao; Yoshiyuki Suzuki, both of Kanagawa, and Hitoshi Kato, Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan

Filed Aug. 14, 1987, Ser. No. 85,599

Claims priority, application Japan, Aug. 18, 1986, 61-125712[U]; Aug. 18, 1986, 61-125713[U]

Int. Cl.[5] B62B *9/12*

U.S. Cl. 280—47.38 **4 Claims**



1. A carriage, comprising:

a rollable seat structure for accommodating a passenger and having two armrests on opposite lateral sides of a seat for said passenger, each said armrest having a fitting hole facing a forward direction from a forward surface of said armrest; and

a guard for constraining said passenger in said forward direction having two fitting pipes on opposite ends thereof fittable into said fitting holes, each said fitting pipe having an engagement projection projectable beyond a lateral surface of said fitting pipe and at least partially retractable into said fitting pipe;

supports with insertion holes for inserting respective ones of said fitting pipes, said supports being disposed within said armrests at a back surface of said fitting holes, wherein each of said supports includes an engagement hole connected with said insertion hole and fittable with a respective one of said engagement projections;

opening operation buttons for releasing an engagement of said engagement projections fitted into said engagement holes; and

elastic supporting arms, each connected at one end to one of said supports and at another end to one of said opening operation buttons, said buttons being normally disposed in said engagement holes.

5,004,254

DRAG BAR MOUNTING STRUCTURE FOR A GOLF BAG DRAG CARRIAGE

Jiin-Tang Wu, No. 35-1, Jih Hsin St., Tu Cheng Hsiang, Taipei Hsien, Taiwan

Filed May 10, 1990, Ser. No. 521,633

Int. Cl.[5] B62B *1/12*

U.S. Cl. 280—47.315 **4 Claims**

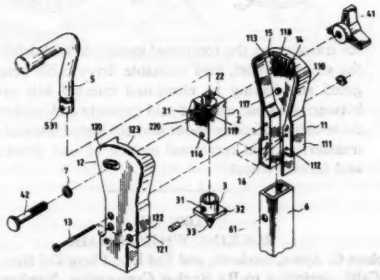
1. A drag bar mounting structure for a golf bag drag carriage, comprising:

a drag bar having a handhold on its top end for holding by hand;

a mounting device for securing said drag bar to a frame bar of a frame of a golf bag drag carriage, including two opposite mounting sheels connected together by means of

a plurality of fastening elements; said two opposite mounting shells each having a unitary pin extending from its inner wall surface at a lower position thereof; a circular guide post extending inwardly from its inner wall surface at a middle position thereof, a notch on its topmost edge, a transversely curved and raised strip on its inner surface near its top, a rectangular hole transversely piercing its inner wall surface, and a plurality of radial and convex stripes on its inner wall surface;

a swinging block made of resilient plastic material through a shape molding process and having a key hole extending vertically through its length, a plurality of concave stripes radially arranged on a portion of opposing sides of said swinging block, a groove extending through said swinging block and intersecting said stripes, a guide post hole horizontally passing through a lower portion of said swinging block beneath said concave stripes, and a pivot hole horizontally passing through said swinging block above said guide post hole and adjacent said stripes;



a positioning member secured to a bottom end of said drag bar by means of rivet joint and having a conical bottom end inserted in a top of said frame bar and a rectangular flange for preventing said drag bar from moving away from said mounting device; and

an adjusting device including a screw rod inserted through said rectangular hole of said two opposite mounting shells and said pivot hole of said winging block, and connected with a swivel knob; said adjusting device permitting said mounting device to squeeze said swinging block for retaining said drag bar in position;

wherein said drag bar is received in said key hole of said swinging block between said two opposite mounting shells, said circular guide posts of said two opposite mounting shells are respectively received in opposite ends of said guide post hole of said swinging block, said two raised strips of said two opposite mounting shells are respectively received in opposite ends of said groove of said swinging block, and said convex stripes of said two opposite mounting shells respectively engage said concave stripes of said swinging block.

5,004,255

PAINTERS PALETTE

Beatrice E. Briggs, 403 Kansas Dr., Goshen, Ind. 46526

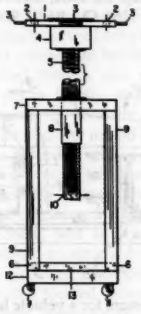
Filed Dec. 21, 1988, Ser. No. 244,337
Int. Cl.[5] B62B *3/10*
U.S. Cl. 280—79.5 **5 Claims**

1. A painter palette comprising an upper holding and carrying platform 1, a middle supporting platform 7, a lower supporting platform 12;

said upper holding and carrying platform having four holes adapted to cooperate with structure depending from an accessory placed on said upper platform;

said upper platform further including a center circle opening holding and carrying a bucket 4 adapted to hold a paint can, said bucket including a brim 6 fastened to the upper supporting platform 1;

a center support spine screw bolt 5 fastened to the bottom center of said holding and carrying bucket, and having a hole 10 in the bottom end for a pin or bolt;



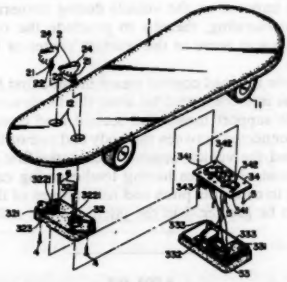
said middle platform including a center support spine screw nut 8 to cooperate with the center spine screw bolt 5 to reinforce, support, raise and lower said upper holding and carrying platform 1.

5,004,256

SOUND AND/OR LIGHT GENERATING DEVICE FOR SKATEBOARDS

John Won, P.O. Box 10780, Taipei, Taiwan

Filed Jan. 10, 1990, Ser. No. 463,213
Int. Cl.[5] B62M *1/00*
U.S. Cl. 280—87.042 **18 Claims**



1. A combination of a skateboard and sound generating device for said skateboard which comprises:

said skateboard containing at least one hole in the board;

an electronic box affixed onto said hole of said skateboard from the bottom, and comprising an electricity means disposed therein;

a sound generating means; and

a first switch means controlling said electricity means to supply electricity to said sound generating means;

said first switch means comprising an operating element disposed on the upper shell of said box and extending through said hole of said skateboard located in the footstep area on said skateboard; whereby stepping

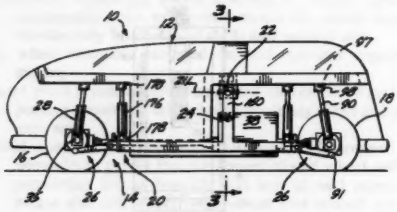
on said operating element of said first switch means results in the transmission of electricity from the electricity means in the electronic box to said sound generating means to thereby generate sound.

5,004,257

VEHICLE SUSPENSION SYSTEM

William L. MacIsaac, 7911 40th Ave. West, Everett, Wash. 98203

Filed Sep. 21, 1988, Ser. No. 247,162
Int. Cl.[5] B62D 9/02
U.S. Cl. 280—112.2 9 Claims



1. A suspension system for a vehicle having a body, comprising:

(a) vehicle support means on opposite sides of the front and rear of the body;

(b) a tie structure interposed between the vehicle support means and the body;

(c) first means for interconnecting the tie structure to the vehicle support means;

(d) second means for pivotally interconnecting the tie structure and the body about a transverse pitch axis and a longitudinal roll axis, both axes being located at effective elevations above the reaction center of the vehicle, whereby upon forces being imposed on the vehicle during turning, braking and accelerating, the body tilts downwardly about the axes relative to the tie structure in the direction opposite to the direction of the resultant forces acting on the vehicle during cornering, braking and acceleration;

(e) load control means operably interconnecting the tie structure, the vehicle support means and the body to permit the pitch and roll axes to shift relative to the vehicle support means in the direction of the resultant of the forces imposed on the vehicle during cornering, braking and accelerating, thereby to preclude the roll axis and pitch axis to serve as the reaction center of the vehicle; and,

(f) wherein the load control means include first load control devices interconnected between the tie structure and the vehicle support means and second load control devices interconnected between the body and one of the tie structure and the vehicle support means, the first and second load control devices having load-carrying capacities selected to cause the pitch and roll stiffness of the tie structure to be greater than the pitch and roll stiffness of the body.

5,004,258

KIT FOR CONVERTING A BICYCLE TO A DUAL WHEEL DRIVEN CYCLE

Billie J. Becoat, 914 Hampton, Alton, Ill. 61604

Continuation of Ser. No. 98,498, Sep. 18, 1987, Pat. No. 4,895,385. This application Sep. 8, 1989, Ser. No. 404,695
The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.
Int. Cl.[5] B62M 1/02
U.S. Cl. 280—259 17 Claims

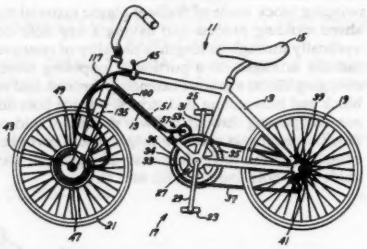
1. A kit for converting a bicycle having a frame, a first motive means including pedals, pedal gear, and chain, a pedal-chain driven first wheel and a non-driven second wheel, into a dual wheel driven bicycle, comprising:

a sprocket connectable in a fixed relation to the second wheel for conjoint movement therewith;

a drive gear means mountable with respect to the frame in the area of said first motive means, said drive gear means including a rotatable drive gear connectable to the first motive means for receiving power therefrom to rotate said drive gear;

a cable gear mountable with respect to the frame and meshable with said sprocket for driving said sprocket; and

a rotatable drive cable drivingly connectable at one end to said drive gear and at its opposite end to said cable gear



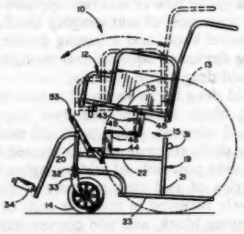
for transferring the rotational motion of said drive gear to the second wheel, said rotatable drive cable being elongated and having an elongated internal axis extending between said one end and said opposite end, said rotatable drive cable rotatable about said elongated internal axis for transferring said rotational motion of said drive gear to said second wheel.

5,004,259

ROCKING WHEELCHAIR

Robert C. Ayers, Burbank, and Ted Lee, Playa Del Rey, both of Calif., assignors to Rx Rocker Corporation, Newbury Park, Calif.

Filed Nov. 15, 1989, Ser. No. 436,755
Int. Cl.[5] B62M 1/14; B62J 1/02
U.S. Cl. 280—304.1 9 Claims



1. An improved wheelchair that permits a user to rock while seated in the chair, said wheelchair comprising:

(a) a frame formed of spaced part rigid side members connected together by cross braces, each of said side members including upper and lower tubular members;

(b) a pair of main wheels connected with said frame and at least one of which serves as a driving wheel for the chair;

(c) at least one caster wheel pivotally connected with said frame;

(d) a seat portion having opposite support members;

(e) a rocking assembly for supporting said seat portion in a rockable relationship to said frame, said assembly having:

1. a first rigid strap means attached to and extended between said upper members of said frame;

2. a second rigid strap means attached to and extended between said support members of said seat portion;

3. spring means connected to said first and second strap means to normally maintain said seat portion in a desired alignment when the chair is unoccupied and to

permit the seat to yieldably rock with respect to said frame

(f) at least one brake and seat lock assembly attached to said frame and which in one position concurrently locks the seat and permits the wheels to move and in an opposite position concurrently locks the wheels and permits the seat to rock.

5,004,260

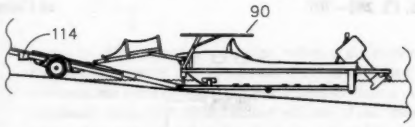
TRAILERED BOAT CRADLE

George M. Smyly, Sr., 1903-B Carlton St., N., Charleston, S.C. 29405

Continuation-in-part of Ser. No. 305,275, Feb. 2, 1989, Pat. No. 4,911,459. This application Dec. 28, 1989, Ser. No. 458,519

Int. Cl.[5] B60P *3/10*

U.S. Cl. 280—414.1 **13 Claims**



8. An improved launcher/retriever boat cradle comprising:

a. a boat keel support platform including keel guide/support blocks;

b. a buoyant wheeled cross tee member including boat transom support blocks and boat keel guide/support blocks, said buoyant wheeled cross tee member secured to the aft end of said boat keel support platform;

c. angle members including rollers, said angle members including edges extending above rollers such that said boat keel support platform upon said rollers is aligned within said extending edges;

d. a folding stabilizer pivotally secured to two vertical members of a second cross tee, said second cross tee secured to a forward vertically secured member of said boat keel support platform, said folding stabilizer also pivotally secured to a stabilizer platform, said stabilizer platform including side support members, said side support members having a slippery entrapment upon two rails, said folding stabilizer having platforms to walk upon and hand rails;

e. a push/pull rod pivotally connected to forward end of said boat keel support platform;

f. launcher and retriever cables counter wound on a reversible drum winch, said retriever cable via a forward pulley is attached to the free end of said push/pull rod and said launcher cable via a forward pulley and aft pulley is also attached at said free end of said push/pull rod;

g. whereby movements of said push/pull rod, keel support platform, stabilizer and stabilizer platform are accomplished;

h. extended railings for guiding and surroundingly engaging the hull of a boat being included with said boat keel support platform and said two cross tees; and

i. wherein said launcher/retriever boat cradle can be combined with a trailer, wherein the improvement comprises:

j. a multi-wheeled, buoyant keel support platform;

k. additional hand rails fixedly attached at the vessel bow end of said cradle;

l. an angled step fixedly attached to said combined trailer;

m. supports fixedly attached at sides of said cradle, said supports having stepping blocks fixedly attached thereto;

n. a forward keel/hull alignment guide fixedly attached to said multi-wheeled keel support platform, said guide conforming to the shape of particular hull designs;

o. hull protecting material upon vessel contact surfaces of said cradle; and

p. a telescoping push/pull rod having outer surfaces of a second component registrable with the inner surfaces of a first component, said first component having an apertured fare end cover plate, an end of an elongated channel member being welded perpendicular to the inner surface thereof, said channel member having a stop for said second component member fixedly attached thereto, said channel member having longitudinally spaced-apart coplanar pulleys rotatingly secured between the lateral sides thereof, said second component having an aft and cover plate fixedly attached thereto, said second component having apertured plates fixedly attached thereto, said plates providing means for pivotally bolting said multi-wheeled keel support platform to said second component, said retriever cable extending directly from a reversible drum winch, passing through said first component cover plate aperture, extending between lateral sides of said channel member, the end thereof being fixedly attached to said second component, said launcher cable extending from said drum winch, training about a pulley secured below said winch, extending aft below said rollers, training about an aft pulley located between said roller supporting angle members, training about said channel member coplanar pulleys, the end thereof being fixedly attached to said second component.

5,004,261

ANTI-THEFT DEVICE

Klaus Hölzl, Vienna, Austria, assignor to TMC Corporation, Baar/Zug, Switzerland

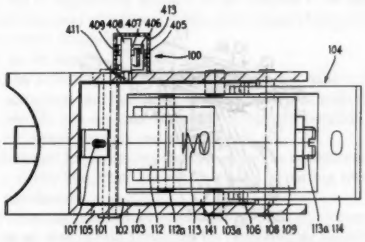
PCT No. PCT/EP88/00547, § 371 Date Apr. 11, 1989, § 102(e) Date Apr. 11, 1989, PCT Pub. No. WO89/01355, PCT Pub. Date Feb. 23, 1989

PCT Filed Jun. 22, 1988, Ser. No. 348,661

Claims priority, application Austria, Aug. 11, 1987, 2024/87

Int. Cl.[5] A63C *11/02*

U.S. Cl. 280—612 **17 Claims**



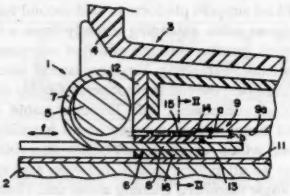
1. In an anti-theft device for a safety ski binding comprising a jaw having at least one sole retainer adapted to be selectively brought into a detent position and into an open position, and at least one mechanically or electronically releasable detent means having a holding position for holding said sole retainer against a resilient force in said detent position and having a release position for permitting said sole holder to move to its open position free of said resilient force, the improvement comprising blocking means adapted to be selectively brought into an open or blocking position in response to control signals generated by a transmitting circuit and sent to a receiving circuit coupled to control means for controlling movement of said blocking means, and including means for permitting said blocking means to assume said blocking position only when said sole retainer is in said open position, wherein when said blocking means is in said blocking position said blocking means prevents said detent means from returning from said release position to said holding position.

5,004,262

FRONT BINDING FOR CROSS-COUNTRY SKI BOOT

Marc Provence, Thorens les Glieres, and Gerard Graillat, Annecy, both of France, assignors to Salomon S. A., Chavanod, France

Filed Nov. 8, 1989, Ser. No. 433,094
Claims priority, application France, Nov. 8, 1988, 88 14551
Int. Cl.[5] A63C 9/00
U.S. Cl. 280—615 8 Claims



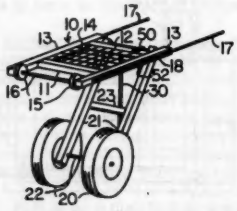
1. A front binding for a cross-country ski boot (3), comprising a locking slide (6) mounted for longitudinal movement in a slide (9, 11) fixed to a ski, said binding comprising, between said locking slide (6) and at least one sliding surface (9a, 11) of said slide (9, 11), a sliding piece (13) of synthetic material, said sliding piece having, on a face thereof subjected to friction resulting from relative movement between said locking slide (6) and said at least one sliding surface (9a, 11), at least one transverse projection (14) of relatively flexible material, said at least one projection being deformed in such a way as to always be applied with a predetermined pressure against a sliding surface on which said at least one projection slides during longitudinal movement of said locking slide (6).

5,004,263

UTILITY CART

Phillip W. Hubbard, P.O. Box 5287, Valdosta, Ga. 31603

Filed Jul. 20, 1990, Ser. No. 556,003
Int. Cl.[5] B62B 1/20
U.S. Cl. 280—645 12 Claims



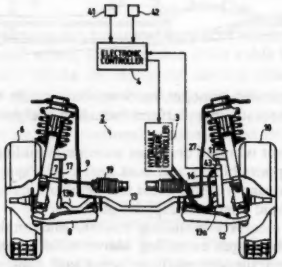
1. A cart comprising:
(A) platform means providing a relatively horizontal surface capable of supporting a load, said platform means having a front end and a rear end;
(B) roller means attached to said front end of said platform means, a portion of said roller means extending below said platform means;
(C) positionable handle means extending rearward from each side of said platform means;
(D) one or more leg members pivotally attached to the rear of said platform means, said leg member or members can be pivoted from a downward position below the level of said platform means, through and between said handle means, to an upright vertical position above the level of said platform means;
(E) wheels mounted on said one or more leg members;
(F) support means pivotally attached to the rear of said platform means, said support means can be pivoted from a downward position below the level of said platform means, through and between said handle means, to an upright vertical position above the level of said platform means;
(G) releasable upward locking means to maintain said one or more leg members and said support means in the upright vertical position.

5,004,264

POSITION CONTROL DEVICE AND AUTOMOTIVE SUSPENSION SYSTEM EMPLOYING SAME

Tetsuji Kozaki; Hiroshi Ishikawa; Hideaki Yasui; Mamoru Shimamoto, all of Nagoya; Katsuhiko Hibino, Toyoake, and Motoshi Suzuki, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 27, 1989, Ser. No. 386,041
Claims priority, application Japan, Jul. 29, 1988, 63-191936; Aug. 18, 1988, 63-204933
Int. Cl.[5] B60G 11/32, 17/00
U.S. Cl. 280—707 16 Claims



1. A position control device for a cylinder assembly, comprising:
adjusting means for adjusting the stroke position of the cylinder assembly in response to a control signal;
predicting means for predicting the stroke position of the cylinder assembly based on said control signal;
position detecting means for detecting when the cylinder assembly has actually reached a predetermined stroke position;
correcting means for correcting the predicted stroke position of the cylinder assembly into said predetermined stroke position when it is detected by said position detecting means that the cylinder assembly has actually reached said predetermined stroke position; and
control means for applying said control signal to said adjusting means so that the predicted stroke position as corrected by said correcting means will be equalized to a target stroke position for the cylinder assembly.

5,004,265

SUSPENSION SYSTEM

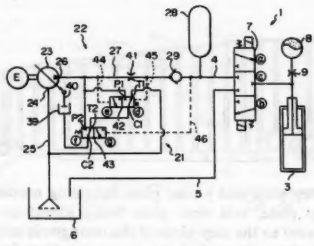
Yoich Mizutani, Kanagawa, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Sep. 19, 1989, Ser. No. 409,095
Claims priority, application Japan, Sep. 20, 1988, 63-235400
Int. Cl.[5] B60G 17/00
U.S. Cl. 280—707 5 Claims

1. In a suspension system designed to effect attitude control of a vehicle and including a suspension unit to be disposed between a vehicle body and a wheel and adapted to receive and discharge a pressure fluid to effect said attitude control and a pressure source mechanism including a reservoir and a pump for supplying the pressure fluid to said suspension unit from said reservoir, the improvement wherein:
said pump comprises a variable displacement pump adapted to be activated in response to the rotation of an engine of

the vehicle, the displacement volume of said pump being controllable; and

said pressure source mechanism further comprising a control mechanism having a restrictor provided in a line connected to a discharge side of said variable displacement



pump to effect control such that, when a difference between the pressure of the pressure fluid at upstream and downstream sides of said restrictor is greater than a predetermined value, said displacement volume of said pump is reduced so as to maintain the discharge of said pump at a substantially constant level.

5,004,266

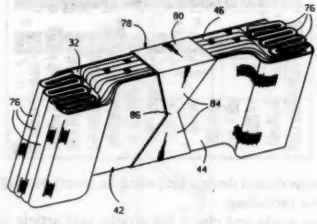
OCCUPANT RESTRAINT SYSTEM

Gregory A. Miller, Troy; Jeffery L. Pearson, Rochester, and John D. Horsch, Rochester Hills, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 23, 1990, Ser. No. 527,477

Int. Cl.[5] B60R *21/20*

U.S. Cl. 280—743 **4 Claims**



1. An occupant restraint system for a vehicle occupant comprising, a source of pressure fluid, support means, an inflatable occupant restraint cushion mounted to the support means and including an upper wall portion facing the occupant, a lower wall portion secured to the support means to mount the cushion thereon, a spaced pair of folded side wall portions interconnecting the upper and lower wall portions, and a spaced pair of end wall portions interconnecting the upper and lower wall portions, and a rupturable band having its end portions secured to the support means and extending over the upper wall portion and one spaced pair of wall portions, the rupturable band having a weakened portion intermediate the end portions thereof and opposite the upper wall portion, the weakened portion being ruptured by the force of the cushion thereagainst upon inflation of the cushion from the source of pressure fluid and the attainment by the cushion of a predetermined internal pressure.

5,004,267

POWER OPERATED SUPPORT OR LANDING LEGS

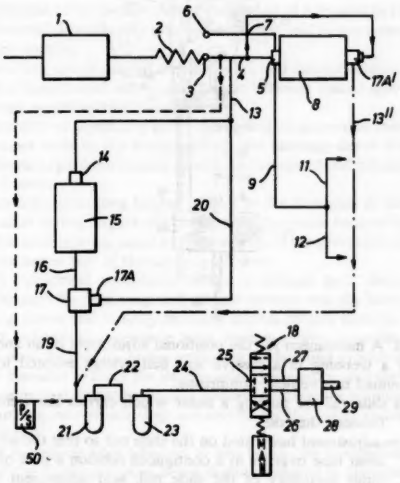
Philip V. Busby, 2 Sunderland Avenue, Pembroke Dock, Dyfed, Wales

Continuation of Ser. No. 203,541, May 27, 1988, abandoned, which is a continuation of Ser. No. 790,076, Oct. 22, 1985, abandoned. This application Jun. 8, 1989, Ser. No. 366,193

Claims priority, application United Kingdom, Oct. 23, 1984, 8426750

Int. Cl.[5] B60S *9/02*

U.S. Cl. 280—766.1 **15 Claims**



1. A system for selective extension and retraction of a support leg of equipment adapted to be coupled to an apparatus for moving said equipment when said support leg is retracted, said system comprising:

(i) an air motor;

(ii) an actuating member of the support leg, said motor and actuating member being adapted to be mechanically coupled to one another such that selective operation of said air motor extends and retracts said leg;

(iii) means for mounting the system on the equipment so that a drive line from the motor to the actuating member is non-linear;

(iv) first and second air reservoirs operatively connected by an air line to said apparatus for receiving air therefrom, an output of said first reservoir being operatively connected to brakes of said equipment and, said second reservoir being operatively connected with said air motor;

(v) a check valve located at an inlet of said second air reservoir;

(vi) an automatic brake protection valve connected between the output of said second air reservoir and said air motor, said automatic brake protection valve being controlled by a pilot connected to said air line at a location upstream of said check valve for automatically closing the flow of air between said second reservoir and said air motor if the air pressure in said air line should drop below a predetermined pressure level; and

(vii) directional control valve means pneumatically connected between said automatic brake protection valve and said air motor, wherein air is retained in said second air reservoir, according to said predetermined pressure level, when the equipment is disconnected from said apparatus.

5,004,268

MECHANISM FOR POSITIONAL ADJUSTMENT OF ANCHOR FOR WEBBING IN PASSIVE SEAT BELT SYSTEM FOR VEHICLE

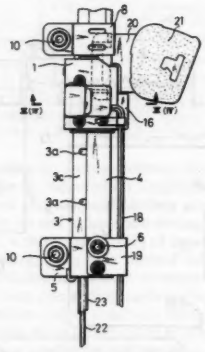
Kazuo Yamamoto, Sagamihara, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 27, 1989, Ser. No. 427,689

Claims priority, application Japan, Oct. 28, 1988, 63-140900[U]

Int. Cl.[5] B60R *22/00*

U.S. Cl. 280—804 7 Claims



1. A mechanism for the positional adjustment of an anchor for a webbing in a passive seat belt system adapted to be mounted in a vehicle, comprising:

a slide rail for guiding a slider which carries the webbing fastened thereon;

an adjustment base fitted on the slide rail so that the adjustment base overlies in a contiguous relation a part of the outer periphery of the slide rail, said adjustment base defining a plurality of interlocking holes at predetermined longitudinal intervals therein and having a first surface and a second surface, said first surface extending in a lengthwise direction of the vehicle when the adjustment base is mounted on the vehicle and said second surface extending substantially at a right angle relative to the first surface;

an anchor base transversely surrounding the slide rail and adjustment base for guided movement along the slide rail and adjustment base, said anchor base being engageable with the slider at an occupant-restraining position; and

a latch supported of the adjustment base and engageable with one of the plural holes formed in the adjustment base so as to lock the anchor base on the adjustment base, thereby determining the position of the anchor base relative to the adjustment base.

5,004,269

STEPPED TOP FLUID STORAGE TANK

J. Eugene Pelt, Ardmore, Okla., assignor to Spade leasing, Inc., Springer, Okla.

Filed Dec. 1, 1989, Ser. No. 444,393

Int. Cl.[5] B60P *3/22*

U.S. Cl. 280—837 5 Claims

1. A fluid storage tank having a top, an underside, a front end and a rear end, and further including:

a pair of substantially parallel side walls;

a rear wall;

a forward wall;

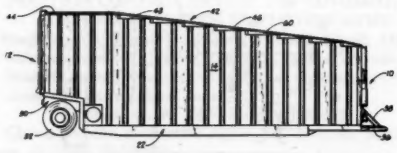
a floor; and

a ceiling which includes:

a flat substantially monoplanar rear panel adjacent said rear wall and extending forwardly toward said forward wall and extending substantially normal to said rear wall;

a stepped topped closure subassembly extending from said rear panel to said forward wall and inclined downwardly toward said floor and including:

a plurality of substantially contiguous steps each including



a step plate and a riser plate extending normal to said step plate, said riser plate being joined at an edge thereof to the step plate of the contiguous step; and

a plurality of parallel rub bars extending fore-and-aft above said ceiling and joined to said steps at the exposed edges thereof where the step plate and riser plate are joined to each other.

5,004,270

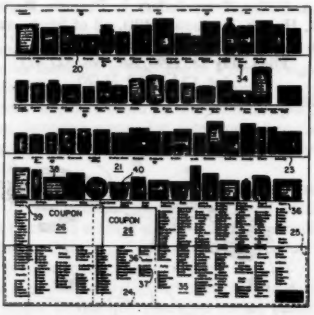
BUYING GUIDE

Malcolm Schaul, 9 Jack La., Marlboro, N.J. 07746, and James Broderick, 2930 Point East Dr., Bld. E Apt. E 601, N. Miami Beach, Fla. 33160

Filed Aug. 17, 1989, Ser. No. 395,501

Int. Cl.[5] B42D *15/00*

U.S. Cl. 283—48.1 3 Claims



1. A promotional device including an insert having coupons, said device including;

a buying guide and check list article, said article detachably secured to said device,

said article including at least one sheet having a first side, said first sheet including indicia representing lists of consumer products, said indicia including indicator means for indicating to the consumer that said coupons are available in said insert for said indicated products.

5,004,271

GREETING CARD SYSTEM

Richard Platt, 7115 Richmond Hwy., Apt. 83, Alexandria, Va. 22306

Filed Mar. 29, 1989, Ser. No. 330,371

Int. Cl.[5] B42D *15/02*

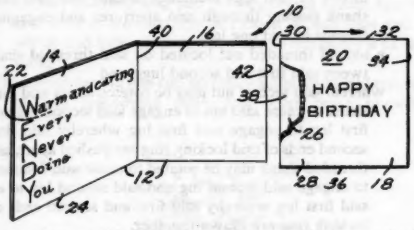
U.S. Cl. 283—65 6 Claims

1. A greeting card system comprising:

a foldable sheet member defining first and second panels;

a separate sleeve element for removably fitting over and

around said second panel, said sleeve element comprised of first and second sheet elements, each of said sheet elements defining a plurality of edges and a separate free, exposed edge, said sheet elements connected to each other substantially along said plurality of edges with said exposed edges positioned in opposed relationship with each other of form a slit-like opening in said sleeve element



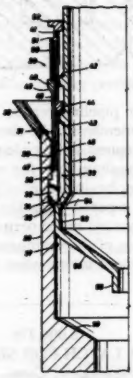
contiguous with and between said exposed edges, and said sleeve element having a first printed message thereon; and wherein said first panel defines opposed front and rear surfaces, said front surface having a second printed message thereon and said rear surface having a plural-lined third message thereon which uses letters of a predetermined portion of said second message as first letters of each line of said third message.

5,004,272

TENDON BOTTOM CONNECTOR FOR A TENSION LEG PLATFORM

Robert M. Kipp, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 15, 1989, Ser. No. 408,004
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—24 **7 Claims**



1. For use with a floating tension-leg platform having a plurality of anchoring tendons extending from the platform with the lower ends of the tendons being connected in tension to anchor means fixedly secured to the ocean floor in deep water, said connection being made by underwater-actuatable and remotely-connectable and releasable tendon connector means, said connector means comprising

first and second connector portions with said second portion adapted to be inserted into said first portion and to be slidably moved therein in an axial direction,

said first connector portion forming a cylindrical receptacle having an open top end with the bottom end secured to said ocean floor anchor means,

a first inwardly-directed camming surface formed around the upper end of said receptacle and adapted to be contacted by latches carried by the second connector portion for retracting the latches,

a circumferential latching groove formed in the inner wall of said cylindrical receptacle and axially displaced from said first camming surface,

a latching shoulder formed on the upper side of said latching groove adapted to seat latches against upward movement,

a second camming surface formed on the lower side of said latching groove and being directed downwardly and inwardly,

said cylindrical receptacle having a bore of reduced diameter below said latching groove,

said second connector portion forming a tubular member adapted to be fixedly carried at the end of a tendon to be inserted downwardly into and latched in said first connector portion,

a latching sleeve carried outwardly on said tubular member for limited axial movement thereon between spaced-apart stop means carried thereon,

a plurality of depending collet spring fingers secured at their upper ends to the lower end of said latching sleeve for limited radial movement relative to the axis of said tubular element,

outwardly-extending latches affixed to the free ends of the collet spring fingers, the diameter of the circle formed by the latches being equal to the diameter of the receptacle at the lower side of the latching groove,

said cylindrical receptacle having a vertical bore therethrough for receiving said tubular element and the latching sleeve and radially movable latches carried thereby,

said cylindrical receptacle bore having a bore extending below the first camming surface to the latching groove of a diameter to force the latches radially inwardly until they are moved downwardly to a position opposite the latching groove into which they are moved by the collet spring fingers,

said receptacle bore adjacent to and below the termination of the latching groove being slightly reduced in diameter to force the latches radially to a second and further retracted position, and

a latch hold-back sleeve carried outwardly on the latches of said latching sleeve and independently axially movable thereon between abutment means so as to drop by gravity into blocking engagement with said latches and against one of the abutment means to hold the latches in a radially retracted and inoperative state when the latches are forced into said second and further retracted position by the reduced bore portion of the receptacle, at which time the first and second connector portions of said connect means may be pulled apart.

5,004,273

TIEBACK THREAD WITH ANGULAR FREEDOM

Benton F. Baugh, 14626 Oak Bend, Houston, Tex. 77079

Filed Jun. 26, 1989, Ser. No. 371,599
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—27 **19 Claims**

9. A pipe connection comprising a male threaded member, a female threaded member, and a pivot point,

said male threaded member having a male thread profile, a first stop shoulder, and a first centerline,

said female threaded member having a female thread profile, a second stop shoulder, and a second centerline,

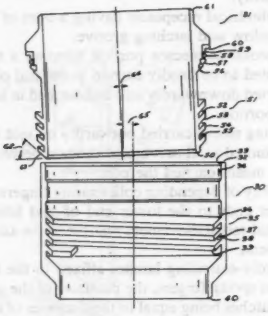
said male thread profile having a first primary bearing surface, a first secondary bearing surface, a first major diameter, and a first minor diameter,

said female thread profile having a second primary bearing surface, a second secondary bearing surface, a second major diameter, and a second minor diameter,

said pivot point being located at or about the centerline of said female threaded member,

said male thread profile and said female thread profile being configured such that when the pipe connection is partially engaged arcuate lines can be drawn about said pivot point and pass between said first and second primary bearing surfaces and between said first and second secondary bearing surfaces,

such that contact between said first and second primary bearing surfaces or contact between said first or second secondary bearing surfaces does not limit the freedom to



be axially misaligned of said first centerline of said male threaded member relative to the said second centerline of said female member relative to the said second centerline of said female threaded member,

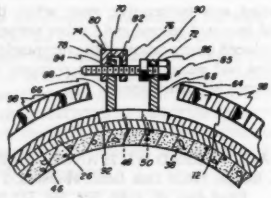
and such that when said first stop shoulder contacts said second stop shoulder and further rotation is imparted to said male threaded member relative to said female threaded member, said male threaded member is caused to be axially aligned with said female threaded member.

5,004,274

SNAP RING JOINT ASSEMBLY

Kevin R. Baas, Beavercreek, Ohio, assignor to Price Brothers Company, Dayton, Ohio

Filed Jan. 3, 1990, Ser. No. 460,428
Int. Cl.[5] F16L *49/00*
U.S. Cl. 285—288 **11 Claims**



1. A pipe assembly comprising:

a first pipe section having a first end portion for receiving a second end portion of a second pipe section to be connected to said first pipe section, wherein the outer circumference of said second end portion is smaller than the inner circumference of said first end portion;

a split locking ring having first and second spaced ends, said locking ring being located within said first end portion for engaging and locking said second end portion of a second pipe section located within said first end portion to said first pipe section;

a slot formed in said first end portion;

a first and second lug attached to respective ones of said first and second ends of said locking rings, each said lug extending through said slot and including means defining a hole in an end of each of said lugs;

a fastener extending through said holes in said lugs, said fastener having a lead and a threaded shank;

a U-shaped nut having first and second legs and a base portion connecting said legs, said legs extending radially inwardly from and on either side of an end of a first one of said lugs such that said first leg is located between said lugs;

means defining an aperture in each of said legs, said aperture in one of said legs including threads and said threaded shank passing through said apertures and engaging said threads in said one leg;

a second threaded nut located on said threaded shank between said first and second lugs; and

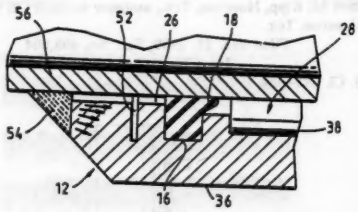
wherein said second nut may be rotated about said threaded shank to cause said nut to engage said second lug and said first leg to engage said first lug whereby said first and second ends of said locking ring are pushed apart, and said threaded shank may be rotated to cause said fastener head to engage said second lug and said second leg to engage said first lug whereby said first and second ends of said locking ring are drawn together.

5,004,275

CLAMP

Jack E. Miller, Houston, Tex., assignor to International Clamp Company, Houston, Tex.

Division of Ser. No. 237,308, Aug. 26, 1988, Pat. No. 4,895,397, which is a continuation of Ser. No. 840,329, Mar. 14, 1986, Pat. No. 4,790,058. This application Jul. 13, 1989, Ser. No. 364,628
Int. Cl.[5] F16L *21/06*
U.S. Cl. 285—373 **27 Claims**



17. A clamp for pipeline repair, the clamp comprising a plurality of clamp members to be clamped to each other about a pipeline to be repaired to complete the clamp, each clamp member having a sealing zone for receiving seal means and each clamp member having a radially extending heat protection groove that is separate from the sealing zone and spaced between the sealing zone and a peripheral zone to the sealing zone during welding of the peripheral zone and thereby provide protection for seal means when positioned in the sealing zone.

5,004,276

PUSH TO CLOSE LATCH FOR SELF-CLEANING OVEN

Roger T. Hanley, Newington, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Jan. 22, 1990, Ser. No. 468,255
Int. Cl.[5] E05B *47/00*
U.S. Cl. 292—126 **19 Claims**

1. In an oven door latching system for use with a stove having an oven door, a latch assembly including;

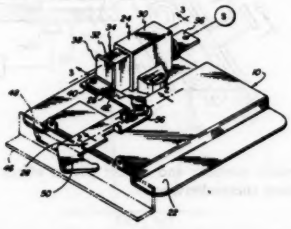
(a) a base member adapted to be mounted on the stove adjacent the oven opening;

(b) a latch bolt having its one end pivotally mounted on a pivot pin on said base member and having a latch arm at the other end engageable with the associated oven door;

(c) a positioning device mounted on said base member comprising (i) a housing, (ii) a positioning slide reciprocatable therein, and (iii) means biasing one end of said slide out-

wardly of said housing, said slide having a plurality of recessed camming surfaces thereon, said device also including a follower member in said housing and having a follower arm at one end thereof adapted to follow said camming surfaces, means mounting said follower member in said housing, said one end of said follower member being movable arcuately relative to said housing and slide, said slide camming surfaces defining two stable positions for said follower arm, said positions being spaced apart in said slide in the direction of motion of said slide and at which said follower arm will seat and releasably lock said slide;

(d) a lever having one end pivotally mounted to said one end of said positioning slide, said lever being pivotally



mounted on said pivot pin at a point spaced from its said one end;

(e) means connecting said latch bolt and said lever adjacent said pivot pin whereby, when said positioning slide is moved, pivotal motion is imparted to said lever and said connecting means enables pivotal motion of said latch bolt; and

(f) actuatable means for acting on said positioning slide to move said one end of said slide towards said housing against the biasing pressure of said biasing means, said movement thereby producing displacement of said slide relative to said follower arm between its said stable positions and concurrent motion of said lever to enable movement of said bolt between an oven door latching position and an oven door unlatching position.

5,004,277

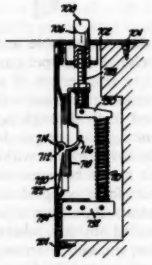
FLUSH BOLT MECHANISM FOR DOUBLE DOORS

Andrew B. Campbell, San Marino, and Ira J. Simon, Long Beach, both of Calif., assignors to Triangle Brass Manufacturing Company, Los Angeles, Calif.

Continuation of Ser. No. 226,467, Aug. 1, 1988, abandoned. This application May 29, 1990, Ser. No. 530,467

Int. Cl.[5] E05B *65/00*; E05C *1/16*

U.S. Cl. 292—166 **14 Claims**



1. A semiautomatic flush bolt for flush mounting on the free edge of one of a pair of swinging doors and operation between an engaged position with a securing surface and a disengaged position, the semiautomatic flush bolt comprising:

a frame member having a surface for mounting essentially flush with the free edge of one of the pair of swinging doors;

said frame member including a track; said track comprising a pair of rails;

a bolt-slide assembly;

said bolt-slide assembly including a sliding member and a link member, said link member having a first end and a second end, said sliding member slidably engaged with said track;

a control member pivotally mounted to said frame member at a pivot axis substantially normal to said pair of rails in contact with said bolt-slide assembly for controlling the position of said bolt-slide assembly; and

a spring coaxially surrounding said link member providing both position bias and override bias for the semiautomatic flush bolt.

5,004,278

DOOR LOCK HAVING SECURITY DEVICE

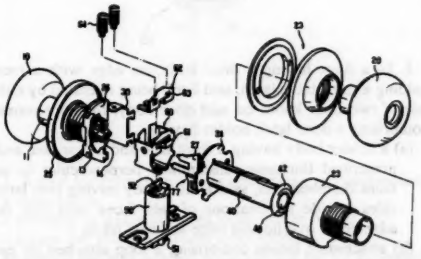
Cheong J. Kang, 522-8, Songnae-1 Dong, Kangdong-ku, Seoul, and Seok J. Kang, 7-12 Seokgyo-Dong Cheongju, Chung Cheong Bukdo, both of Rep. of Korea

Filed Nov. 20, 1989, Ser. No. 439,442

Claims priority, application Rep. of Korea, May 25, 1989, 7012

Int. Cl.[5] F05C *1/08*

U.S. Cl. 292—169.18 **6 Claims**



1. In a door knob latch set having a locking mechanism of the push knob variety, including:

an outer handle, said outer handle being coupled with an outer rotating tube and an inner rotating tube, said outer rotating tube and said inner rotating tube having arcuate projections projecting from the end opposite said outer handle, and said inner rotating tube having an elastic support plate covering said end opposite said outer handle;

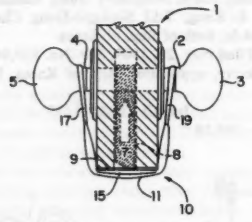
an inner handle having a push knob centrally disposed therethrough, said push knob being attached to a first end of a shaft, said shaft passing through a movable pipe and having at a second end a first leading end and a second leading end; and

a cylinder, said cylinder having therethrough a latch elastically supported by a spring, said latch being connected at one end with a lower portion of a runner, said runner being coupled at an upper portion with a lock plate, said runner being coupled on a first side with said outer rotating tube, and said runner being coupled on a second side opposite said first side with said movable pipe;

THE IMPROVEMENT WHEREIN said lock plate is provided with at least one insertion slot, said arcuate projections of said inner rotating tube and said outer rotating tube being respectively provided with a centrally located insertion slot; and a security device being provided, said security device including a locking plate having a first integral locking pin and a second integral lock-

ing pin, two circular rods coupled with said locking plate, two springs installed on said circular rods, and a spring washer installed to the ends of said circular rods, said security device being inserted into said movable pipe adjacent to said inner handle, said security device having a knob projecting out from said inner handle and around said push knob, whereby said security device may be manipulated back and forth into said moveable pipe.

5,004,279
DOOR LATCH HOLDER
Ruth Radcliff, P.O. Box 2881, Warner Robins, Ga. 31099
Filed Jul. 20, 1989, Ser. No. 382,223
Int. Cl.[5] E05C *19/18*
U.S. Cl. 292—288 **3 Claims**



1. In a door having a door body, an edge with a recess guiding a retractable latch, said latch being operated by either one of two door knobs on said door body, the improvement comprising a door latch holder having:

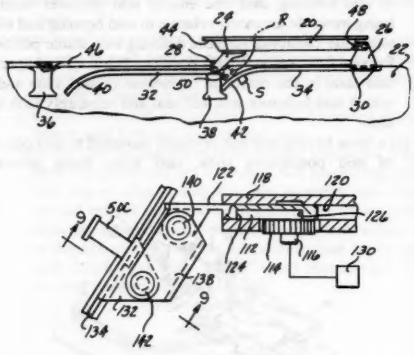
(a) a holder body having a front face and a rear face and a prescribed thickness substantially perpendicular to said faces therebetween, said holder body having two lateral sides at side terminations of said faces, said rear face adapted to overlie said edge and said latch;

(b) attachment means comprising a loop attached on each said side of said body, each said loop mountable over a respective said door knob;

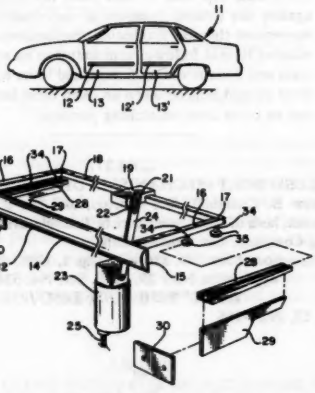
(c) said holder with said loops mounted over said knobs restraining said latch in a retracted position.

5,004,280
VARIABLE POWER DRIVE FOR SLIDING DOOR
William W. Schap, Jackson, Mich., assignor to ITT Corporation, New York, N.Y.
Continuation of Ser. No. 318,565, Mar. 3, 1989, abandoned. This application Feb. 7, 1990, Ser. No. 476,206
Int. Cl.[5] E05B *15/02*
U.S. Cl. 292—341.16 **9 Claims**

1. A striker assembly in combination with a fixed frame defined a vehicle door opening adapted to be opened or closed by a sliding door, said striker assembly comprising a striker pin mounted to a vertical portion of said fixed frame for movement along a first fixed linear path between a door closed position adjacent an inner edge of said frame and a ready position adjacent an outer edge of said frame, and drive means for moving said striker pin between said two positions, said drive means comprising actuation means drivingly engaging a slide member for movement along a second fixed linear path angularly offset from said first linear path, and means interconnecting said slide member and striker pin to effect sychronized displacement thereinbetween.



5,004,281
AUTOMOBILE SIDE DOOR EXTENDABLE AND RETRACTABLE BUMP PROTECTOR
Toshio Yamazaki, 7725 Manderville, #205, Dallas, Tex. 75231
Filed Jan. 9, 1989, Ser. No. 294,189
Int. Cl.[5] B60R *19/38*
U.S. Cl. 293—118 **9 Claims**



5. A vehicle side door extendable and retractable bump protector comprising: elongate bumper guard means extending substantially the front to rear length of a vehicle side door; spaced parallel bars extending from inside the vehicle side door and moveable back and forth through openings in the door outer skin surface mounting said elongate bumper guard means on the bar outer ends; drive means within said vehicle side door; and interconnect means between said drive means and said spaced parallel bars for driving of said elongate bumper guard means from a retracted position adjacent the door outer skin surface to an extended position; wherein said drive means is resilient spring means; and said interconnect means includes connection of spring end means to said spaced parallel bars and connection of said resilient spring means to structure of the door; and wherein a cross member interconnects the rear ends

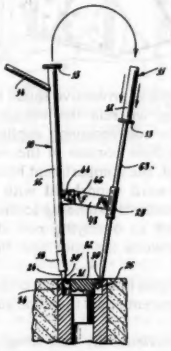
of said spaced parallel bars; latch means for latched holding of said cross member and thereby holding of the door extendable and retractable elongate bumper guard means in the retractable position and manual latch means including linkage structure interconnecting said latch means and a door window sill mounted latch activating button.

5,004,282

NEW AND USEFUL IMPROVEMENTS IN UTILITY STREET COVER REMOVAL TOOLS AND METHODS

Scott G. Perry, North Berwick, Me., assignor to Perry Equipment Corporation, North Berwick, Me.

Filed Dec. 22, 1989, Ser. No. 454,895
Int. Cl.[5] B65G 7/12
U.S. Cl. 294—16 **13 Claims**



1. A device for removing utility street covers comprising
a shaft having
an interior hole extending from one end of said shaft,
a downward oriented combined claw hook—chisel point at the other end of said shaft,
an impact surface at said one end, and
a pivoted hammer arm receptacle mounted on the outside of said shaft below the mid-point along the length of said shaft,
and a rod-like weighty hammer arm that is removeably slideably positionable within said hole, said hammer arm having
a handle at its upper end with an impact surface at the lower end of said handle for impinging upon said impact surface on said shaft when said hammer arm is moved to its point of greatest penetration into said interior hole in said shaft, and
a downward oriented claw hook at its lower end,
said hammer arm receptacle
having a tubular hole into which said hammer arm may be slideably moveably positioned,
being mounted on said shaft with the axis of said tubular hole substantially in the same imaginary flat plane as the axis of said interior hole in said shaft, and
being adapted to pivot with respect to said shaft to enable an imaginary line representing an extension of the axis of said tubular hole with respect to that of said shaft when a hammer arm is positioned within said tubular hole to move among one of intersection above said receptacle, and one of parallelism, and one of intersection below said receptacle,
whereby, such a hammer arm positioned within said shaft may be used to impel the claw hook-chisel point on said shaft downward through foreign matter in one or more of the access apertures of a utility street cover to a desired extent by repeatedly slideably moving said hammer arm vertically upward, and then downward until its impact surface collides with that of said shaft, and whereby said hammer arm may be removed from said shaft and slid into position within said tubular hole in said receptacle to form, with said shaft, a double armed extraction device for simultaneously penetrating access apertures on substantially opposite sides of a utility street cover and hooking the underside of same with said claw hooks, and thereafter removing same from its seat.

5,004,283

ROTARY WEED EXTRACTOR

John F. Sullivan, Dallas, Tex., assignor to Robert S. Scheurer, Wichita Falls, Tex.

Continuation of Ser. No. 295,224, Jan. 9, 1989, abandoned. This application Jun. 1, 1990, Ser. No. 532,184
Int. Cl.[5] A01B 1/16; A01D 9/06
U.S. Cl. 294—61 **4 Claims**

2. A tool for extracting weeds comprising, in combination:
a spike block;
a plurality of spikes attached to said spike block;
a torque bar attached to said spike block;
an ejector carriage coupled to said torque bar for movement between retracted and extended positions relative to said spike block, said carriage having an ejector plate disposed between said spikes, a push plate movably coupled onto said torque bar, and a side panel connecting said push plate to said ejector plate; and,
wherein said ejector carriage has an interior shoulder portion disposed between said push plate and said ejector plate, said interior shoulder portion being engagable by said spike block as said carriage is moved to an extended position relative to said spike block.

5,004,284

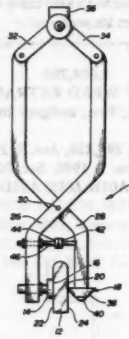
METHOD AND APPARATUS FOR SUPPORTING A SHEET OF GLASS

Premakaran T. Boaz, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 22, 1989, Ser. No. 440,165
Int. Cl.[5] B66C 1/48
U.S. Cl. 294—118 **15 Claims**

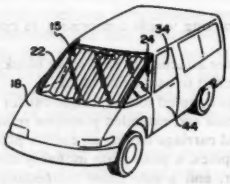
1. A method of supporting a sheet of glass, including the steps of:
providing a first support element, having a flat support surface,
providing a second support element, having a sharp support edge,
moving said first and second support elements toward each other such that said flat support surface of said first sup-

port element is brought into contact with a first side of a sheet of glass, and said sharp support edge of said second support element is brought into contact with a second side of a sheet of glass, and



limiting the movement of said first and second support elements, such that when the glass is heated, the sharp support edge will dig into the surface of the glass only to a predetermined depth.

5,004,285
SUN-SHIELD
Mark Bennett, 29992 Deerfield, New Baltimore, Mich. 48047
Filed Feb. 12, 1990, Ser. No. 479,049
Int. Cl.[5] B60J *3/00*
U.S. Cl. 296—1.1 **6 Claims**



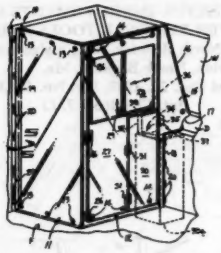
1. A foldable sun-shield for use with a vehicle, the vehicle having a windshield, a dashboard, and two wing window panels, each wing window panel being disposed along each side of the vehicle and disposed in an essentially vertical orientation the windshield being disposed at an inclined angle relative to a horizontal plane, the sun-shield comprising:

(a) a front panel comprising a plurality of foldable panels, the foldable panels being generally foldable along longitudinal edges thereof, the front panel being made of a generally rigid and opaque material, the front panel having a length substantially equal to the height of the windshield, the front panel having an unfolded position and a folded position, the width of the front panel in the unfolded position being essentially as wide as the windshield;

(b) a first and a second side panel each having a length and a height, the first side panel being foldable affixed to an end of the front panel, the second side panel being foldable affixed to an end of the front panel opposite the first side panel, and,

wherein each side panel is mountable upon the top of the dashboard, thereby supporting the sun-shield in a position adjacent to the windshield.

5,004,286
TRANSPORT VEHICLE PROTECTIVE SHIELD
Sylvester R. Taylor, III, and Joann Taylor, both of 2288 S. Holly, Fresno, Calif. 93706
Filed Sep. 18, 1989, Ser. No. 408,668
Int. Cl.[5] B60R *27/00*; B62D *47/02, 33/06*
U.S. Cl. 296—24.1 **6 Claims**



1. A transport vehicle protective shield in combination with a transport vehicle, wherein the vehicle includes a driver compartment, and a coin-receiving appliance mounted vertically, relative to a floor portion of the vehicle, adjacent the driver compartment, the compartment bounded by a side wall extending to a forward windshield with a dashboard panel underlying the windshield extending to the floor and the compartment defined by an overlying roof defining a predetermined distance between the roof and the floor, the shield comprising

a first transport panel integrally and orthogonally secured to a second transparent panel to define an "L" shaped shield, and

a third panel coextensively and integrally mounted to a forward vertical edge of the second panel, and

the second panel including a door member hingedly mounted to the second panel, and

a latch means mounted to secure the door member to the second panel, and

the first panel mounted to the side wall and the third panel mounted to the dashboard panel to enclose the driver compartment, and

wherein the first panel, and the second panel, and the third panel are each of a vertical height equal to the predetermined distance, and

wherein the door member includes a window slidably mounted within the second panel, the window including a latch to secure the window in a closed orientation relative to the door member, and

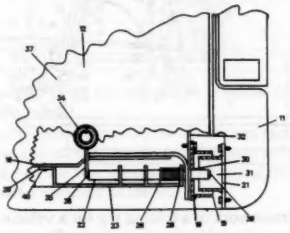
further including a displacement door hingedly mounted to the door member, the displacement door mounted within a lowermost corner of the door member and remote from a series of hinges mounting the door member to the second panel.

5,004,287
LOCKING DEVICE FOR REMOVABLE TAILGATE ASSEMBLY
Pat Doyle, P.O. Box 924128, Houston, Tex. 77292-4128
Filed Jul. 25, 1989, Ser. No. 384,503
Int. Cl.[5] B62D *25/00*
U.S. Cl. 296—57.1 **6 Claims**

1. In combination with a pickup truck having a truck body and a tailgate mounted on the truck body, such tailgate being attached by a hinge mechanism having an axis, such hinge mechanism comprising a pin member connected to the truck body and a receiving cup connected to the tailgate for removable engagement of the pin member within the receiving cup, such hinge mechanism allowing rotation of the tailgate about the axis of the hinge mechanism, a locking device comprising:

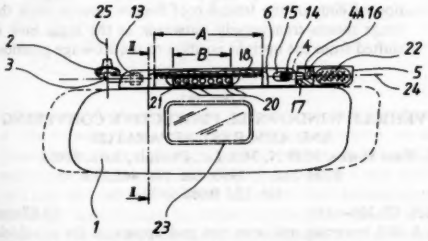
a lock bolt housing connected to the tailgate member;

a lock bolt contained within the lock bolt housing;
said lock bolt being laterally movable with relation to the said tailgate member and lock bolt housing;
said lock bolt housing and lock bolt being so located on the tailgate with relation to the receiving cup and pin member of the hinge mechanism that a central axis of the lock bolt, coincides with a central axis of the receiving cup and a central axis of the pin member;
an opening provided at the central axis of the receiving cup, such opening having a diameter slightly larger than a diameter of the lock bolt;
an opening provided at the central member, such opening having a diameter slightly larger than the diameter of the lock bolt;



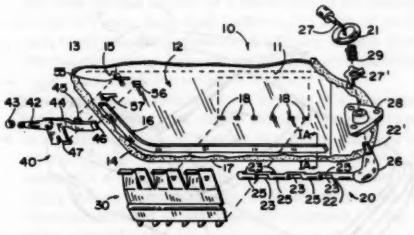
means for providing lateral movement of said lock bolt in the direction of the central axis of the lock bolt through the receiving cup opening into the pin member opening;
means for providing lateral movement of said lock bolt in the direction of the central axis of the lock bolt out of the receiving cup opening;
wherein said lock bolt may be moved along its axis in relation to said receiving cup and pin member thereby causing the said lock bolt to be received within the pin member opening and thereby preventing disengagement of the pin member from the receiving cup while the lock bolt is so received.

5,004,288
SUN VISOR FOR MOTOR VEHICLE HAVING A SLIDABLE MAIN BODY
Lothar Viertel, Altforweiler; Peter Kaiser, Wermelskirchen, both of Fed. Rep. of Germany, and Patrick Welter, La Chambre, France, assignors to Gebr. Happich GmbH, Fed. Rep. of Germany
Filed Dec. 19, 1989, Ser. No. 452,784
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1988, 3842706
Int. Cl.[5] B60J *3/02*
U.S. Cl. 296—97.11 **18 Claims**



1. A sun visor for motor vehicles comprising:
a sun visor body for blocking light and having a first longitudinal top edge and an opposite second longitudinal bottom edge;
a first slide bearing element coupled to the visor body along the first longitudinal edge thereof, the coupling between the visor body and the first slide bearing element prohibiting the relative rotation of the visor body around the first longitudinal edge with respect to the first slide bearing element;
an elongate carrier body above the first top edge of the visor body for carrying the visor body, the carrier body including a third longitudinal bottom edge extending parallel to the first longitudinal edge of the sun visor body and an opposite fourth longitudinal top edge; a second slide bearing element arranged on the third longitudinal bottom edge of the carrier body; the first and second slide bearing elements being engaged for enabling translation of the visor body along the first longitudinal edge with respect to the carrier body while prohibiting rotation of the visor body around the carrier body;
the height of the visor body between the first and second edges being substantially greater than the height of the carrier body between the third and fourth edges;
the carrier body having opposite end regions; a bearing hole being defined in the carrier body at one end region for receiving a sun visor shaft about which the carrier body may be rotated.

5,004,289
VISOR TORQUE CONTROL
Mike L. Lanser, and Tony J. Elenbaas, both of Holland, Mich., assignors to Prince Corporation, Holland, Mich.
Filed Sep. 27, 1989, Ser. No. 413,235
Int. Cl.[5] B60J *3/00*
U.S. Cl. 296—97.12 **16 Claims**



1. A visor torque control for a generally cylindrical visor pivot rod having a given diameter comprising:
a member having a generally planar body located generally on a plane with a plurality of spaced tips extending outwardly from one edge thereof and offset from the plane of said member; and
a plurality of alternately staggered elongated spring arms formed on an edge of said body opposite said tips and having a longitudinal axis, said arms including means between adjacent pairs of said arms for holding said cylindrical pivot rod in alignment.

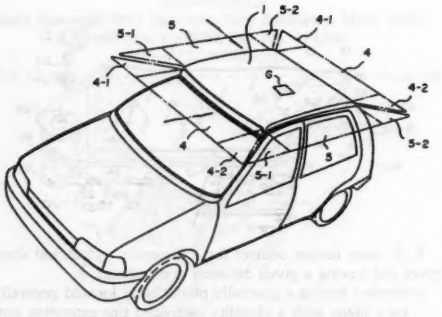
5,004,290
SUN BLIND FOR USE IN AUTOMOBILE
Youngchol Kim, Sajic Royal Apt. 2 cha, 1-208, 632-4, Sajic, 2-dong, Rep. of Korea
Filed Oct. 3, 1989, Ser. No. 416,602
Claims priority, application Rep. of Korea, Oct. 7, 1988, 16622
Int. Cl.[5] B60J *1/20*
U.S. Cl. 296—99.1 **5 Claims**

1. A sun blind for use on an automobile, comprising:
a base (3) with opposite sides and opposite ends, said base having a pair of main side panel guides (3-1), one on each side of said base, extending in a side direction;
a main side panel (5) slidably mounted to each main side panel guide for movement in the side direction, each main

side panel having a pair of corner side panel grooves (5-3, 5-4) therein, extending transversely to the side direction;

a pair of corner side panels (5-1, 5-2) for each main side panel, each corner side panel having at least one upper roller (5-5, 5-6) and at least one lower roller (5-7, 5-8), said lower roller of each corner side panel being engaged within one of said corner side panel grooves;

a middle frame (2) having opposite sides and opposite ends, said middle frame being positioned over and being connected to said base with said main side panels and said corner side panels between said middle frame and said base, said middle frame having a pair of corner side panel grooves (2-8, 2-10) on each side of said middle frame, each corner side panel groove extending at an acute angle to said side direction with the corner side panel grooves on each respective side of said middle frame extending in opposite acute angles, said upper roller of each corner side panel being engaged for guiding movement in a respective one of said corner side panel grooves so that movement in a side direction of said main side panels causes movement of said corner side panels at said acute angles, said middle frame having an upper surface with a pair of main end panel guides (2-1, 2-4), one at each end of said middle



frame and each extending in an end direction, said middle frame including a pair of corner end panel grooves (2-3, 2-6) at each end thereof, said corner end panel grooves on each respective end of said middle frame extending at opposite acute angles with respect to said end direction;

a main end panel (4) slidably mounted in each main end panel guide for movement in the end direction, each main end panel having a pair of corner end panel grooves therein extending transversely to the end direction;

a pair of corner end panels (4-1, 4-2) for each main end panel, each corner end panel having at least one upper roller and at least one roller, said upper roller of each corner end panel being engaged for sliding along one corner end panel groove in one of said main end panels, and said lower roller of each corner end panel being engaged for movement along one of said corner end panel grooves of said middle frame for movement of said corner end panels at the acute angles of said corner end panel grooves with movement of said main end panels; and

drive means connected to said main side panels and to said main end panels for movement of said main side panels in the side direction and movement of said main end panels in the end direction.

5,004,291
TOP FRAMEWORK OF A FOLDING TOP FOR VEHICLES

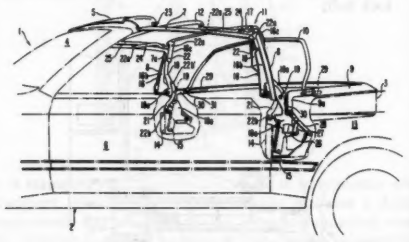
Theodor Bauer, Altenriet, and Gerhard Zweigart, Aidlingen, both of Fed. Rep. of Germany, assignors to Daimler-Berg AG, Fed. Rep. of Germany

Filed Jul. 25, 1988, Ser. No. 223,368

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1987, 3724532

Int. Cl.[5] B60J 7/12

U.S. Cl. 296—116 **22 Claims**



1. Top framework of a folding top for a vehicle comprising:

a main bow pivotable about a horizontally extending vehicle transverse axis, the main bow having a top member and side struts extending outwards and downwards from the top member when the main bow is in an upright position, each side strut having a strut section which extends downwardly more steeply than a lateral contour of the vehicle and with an inward offset therefrom;

a roof skin retaining rail linked laterally outside of each of the strut sections of the main bow on each side of the vehicle, each of the roof skin retaining rails being transferable between a roof skin stretching position lying essentially flush with a surface plane of a side wall of the folding top when the main bow is in the upright position and a folding position moved closer to an associated strut section;

a lateral roof frame positioned at each side of the main bow adjacent to an associated side strut of the main bow when the main bow is in the upright position;

further framework means connected to at least one of the lateral roof frames for coupling each of the lateral roof frames to the main bow so that during a shifting of the main bow from the upright position, each of the lateral roof frames is forcibly controlled into a stowage position adjacent to and substantially parallel to the strut section of the associated side strut of the main bow; and

a front roof frame interconnecting each of the lateral roof frames and including hinge means for permitting deflection of ends of the lateral roof frames remote from the hinge means transversely outwards as the main bow is shifted from the upright position to the stowage position.

5,004,292
VEHICLE WINDOWSILL PROTECTIVE CONVERING AND ARM REST APPARATUS

G. Kent Horne, 9529 N. 34th La., Phoenix, Ariz. 85051

Filed Jan. 9, 1990, Ser. No. 462,235

Int. Cl.[5] B60J 9/00

U.S. Cl. 296—153 **11 Claims**

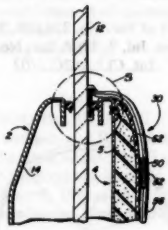
6. Sill covering and arm rest pad apparatus for a vehicle having a window movable upwardly and downwardly, a door panel, a gasket extending between the window and the door panel, a bottom on the gasket, and a sill on the door panel adjacent to the window, the sill covering and arm rest pad apparatus comprising, in combination:

base element means, including

a base element disposed between the window and the gasket and extending above and below the gasket,

a top edge on the base element, above the gasket and

stop means spaced apart from the top edge and disposed against the bottom of the gasket for preventing the



apparatus from moving as the window is moved upwardly; and

pad means disposed generally parallel to and against the base element and secured to the base element adjacent to the top edge of the base element for covering the sill and the door panel adjacent to the sill.

5,004,293

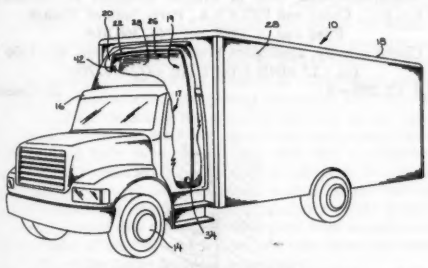
CARGO TRUCK BODY

John F. Thomas, Goshen, Ind., assignor to Cargo Master Incorporated, Goshen, Ind.

Filed Mar. 21, 1990, Ser. No. 496,763

Int. Cl.[5] P60P *3/32*

U.S. Cl. 296—166 **4 Claims**



1. A truck for hauling cargo, said truck comprising a frame, a cab defining a passenger compartment mounted on said frame, and a body defining a cargo compartment mounted on said frame and having a front wall spaced from a rear wall of said cab, said cab rear wall and body front wall having aligned openings therethrough to define a passage to permit travel between the cab and the body, and a flexible boot connected between said cab rear wall and said body front wall, said boot spanning a gap between the cab rear wall and body front wall and constituting means for absorbing vibrational forces generated by said cab during road travel and an interior cover sheet overlying said boot, fastener means for securing said cover and boot to said body front wall and cab rear wall.

5,004,294

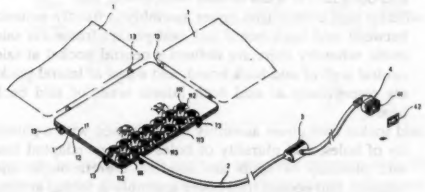
BUILT-UP TYPE AIR-CONDITIONING CUSHION ASSEMBLY

Peir-Kuen Lin, 4th Fl., No. 49, An Leh Street, Sanchung City, Taipei Hsien, Taiwan

Filed Jun. 28, 1989, Ser. No. 372,635

Int. Cl.[5] A47C *7/72*

U.S. Cl. 297—180 **9 Claims**



1. An air-conditioning cushion assembly comprising:

an assembly of a plurality of block-shaped elements each having a top defining a center hole therethrough, a bottom, and a side extending between said top and said bottom, each of said block-shaped elements defining a chamber therein communicable with the center hole defined by the top, and said plurality of block-shaped elements being interconnected in a side-by-side manner in said assembly such that at least some of said bock-shaped elements have the sides thereof located at a lateral side of the assembly;

ventilation means extending between the sides of each of said block-shaped elements and defining tunnels placing the chambers of said plurality of block-shaped elements in open communication with one another;

connecting means extending from the side of at least one of said some of said block-shaped elements and open to each said chamber defined therein for freely allowing said assembly to be connected to another said assembly in a manner in which the chambers defined in said plurality of block-shaped elements are placed in communication with chambers defined in block-shaped elements of said another assembly; and

a vent pipe connected to said assembly, and open to the chambers defined in said block-shaped elements thereof, for allowing air to pass therethrough into each said chamber.

5,004,295

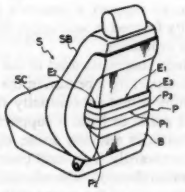
POCKET IN AUTOMOTIVE SEAT

Nobuhiro Inoue, Akishima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1989, Ser. No. 447,610

Int. Cl.[5] A47C *7/62*

U.S. Cl. 297—191 **10 Claims**



1. A pocket in an automotive seat, in which said seat includes a seat back and a back board securely attached to a rear portion of said seat back, said pocket comprising:

a pocket frame having a plurality of studs integrally formed therewith, said studs being fixed to said back board; and

a pocket trim cover assembly which is securely attached by said pocket frame to said back board;

wherein said back board is formed in a generally U-shaped configuration in section, such as to encompass the central and both lateral walls of said rear portion of said seat back, and comprises a central wall and a pair of lateral walls, and has formed therein, a plurality of holes through which are inserted said plurality of studs of said pocket frame;

wherein said pocket frame is formed in a generally upright U-shaped configuration, such as to encompass a central and both lateral walls of said back board, and

wherein said pocket trim cover assembly is fixedly secured between said back board and said pocket frame via said studs, whereby there are defined a central pocket at said central wall of said back board, and a pair of lateral pockets respectively at said both lateral walls of said back board;

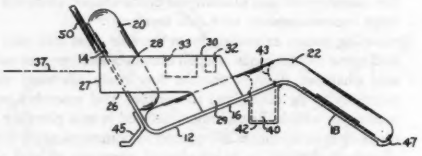
said socket trim cover assembly being formed with a plurality of holes, said plurality of holes being so adapted that said plurality of studs are inserted therethrough, and wherein said pocket trim cover assembly is folded around said pocket frame and secured thereto by means of said studs of said pocket frame and a plurality of fixing means.

5,004,296

FLOATING LOUNGE CHAIR

James N. Ziegenfuss, Jr., 2525 Apt. 6 Royal Palm Ave., Ft. Myers, Fla. 33901

Filed Aug. 2, 1989, Ser. No. 388,521
Int. Cl.[5] A47C 7/62
U.S. Cl. 297—194 **3 Claims**



1. A chair adapted to support a person in an semi-prone position while the chair is floating in the water, comprising:

a rigid concave shell structure that includes an S-shaped panel having two reverse curves therein for defining an upwardly-inclined rear section adapted to support a person's back area, an intermediate section adapted to support a person's buttocks and upper leg areas, and a declining front section adapted to support a person's lower leg areas;

said shell structure further including two arm rest panels attached along opposite side edges of the intermediate section of said S-shaped panel; each arm rest panel being formed of a closed cell rigid plastic foam material; each arm rest panel having an upper face extending above a plane of the intermediate section of the panel that has sufficient size to support a person's lower arm, and at least one cavity formed in said upper face for containment of a beverage container;

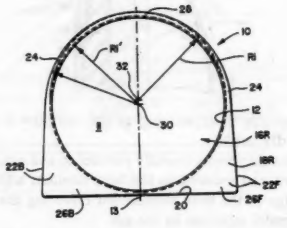
air-inflated cushion means secured to the S-shaped panel for cushionably supporting a person in the chair; said cushion means extending along substantially the entire length of said S-shaped panel to form a support surface for a person's back, buttocks and leg areas; rigid leg means (45) extending downwardly from said concave shell structure at the rear section thereof, whereby the chair is adapted to support a person out of the water with said leg means and said front section of the panel resting on the land surface; and an upwardly-opening compartment means (40) extending downwardly from the intermediate section of said panel for containment of a number of canned beverages within reach of a person seated in the chair.

5,004,297

PORTABLE, SAFETY, PLAY CHAIR

Marcella H. Schmitt, 190 S. Wood Dale Rd. #706, Wood Dale, Ill. 60191

Continuation-in-part of Ser. No. 328,088, Mar. 23, 1989. This application Jul. 7, 1989, Ser. No. 376,417
Int. Cl.[5] A42C 3/02
U.S. Cl. 297—270 **25 Claims**



1. A portable, safety, play chair, comprising: a chair body including

a smoothly curved wall closed inwardly upon itself to form upper and lower portions having a length and extending between a pair of opposite sides of the wall, and

an opening at one of said sides of the wall for entry of a person to repose within the closed curved wall; and

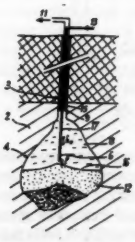
a base for supporting the chair body against tipping and rolling movement including a relatively thin, substantially planar foot attached to the lower portion of the curved wall in underlying relationship therewith and extending across said length and laterally from the one side of the wall to resist tipping of the chair body.

5,004,298

METHOD OF RAPIDLY ABANDONING LARGE CAVITIES WASHED-OUT IN ROCK SALT

Alain Boulanger, Levallois-Perret, and André J. Rousseau, Neuilly-sur-Seine, both of France, assignors to Geostock S.A.R.L., Cedex and ESYS S.A., Paris, both of, France

Filed Jun. 2, 1989, Ser. No. 360,816
Claims priority, application France, Jun. 2, 1988, 88 07336
Int. Cl.[5] B09B 3/00; E21B 43/28, 47/04
U.S. Cl. 299—5 **20 Claims**



1. A method of rapidly abandoning a cavity washed out in rock salt and initially filled with brine, said method comprising the following steps:

(a) injecting quantities of a mixture into said cavity, the density of said mixture being greater than that of the brine, and the mixture being capable of setting, with equivalent quantities of said brine being simultaneously displaced upwardly and expelled from said cavity,

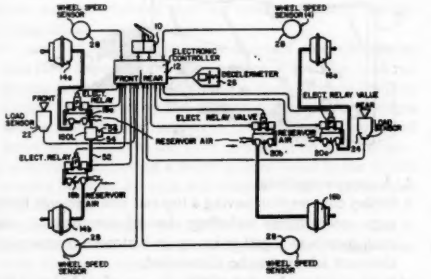
(b) continuing such injection and brine expulsion until said cavity is completely filled with said mixture;
(c) maintaining communication between the outside and said filled cavity during a waiting period whose length is exclusively determined by the time required for the injected mixture to set and for said rock salt to creep into and close shrinkage voids that develop in the set mixture, without regard to the establishment of thermal equilibrium in and surrounding the cavity; and
(d) thereafter sealing said cavity.

5,004,299

ELECTRONIC BRAKING SYSTEM

Malcolm Brearley, Solihull, and Richard B. Moseley, Leamington Spa, both of England, assignors to Lucas Industries public limited company, Birmingham, England

Filed Mar. 6, 1990, Ser. No. 487,901
Claims priority, application United Kingdom, Mar. 8, 1989, 8905311
Int. Cl.[5] B60T *8/88, 8/32*
U.S. Cl. 303—15 **15 Claims**



1. In a vehicle dual wheel braking system in which a respective electronically controlled pressure adjustment channel is provided for each of the wheels at the opposite ends of an axle of the vehicle for setting the braking pressures individually for each wheel in dependence upon a common electrical signal representative of the braking demand level set by a driver of the vehicle, each channel comprising a pressure control loop containing a pressure controller, a pressure control valve which adjusts the supply of fluid from a reservoir to the brake actuators for applying and releasing the brakes by solenoid control of the inlet and exhaust functions of the pressure control valve, and a feedback transducer which supplies a signal representative of the control pressure in the pressure control valve, the improvement comprising respective fault monitoring means for detecting the presence of faults in the signals provided by the two feedback transducers, and means responsive to said fault monitoring means such that if a feedback signal fault is detected in one of said two channels the individual pressure control on that channel is disabled and the solenoids controlling inlet and exhaust functions of the pressure control valve of that channel are energised from an alternative mechanism of control which does not rely upon the output signal from the faulty feedback transducer.

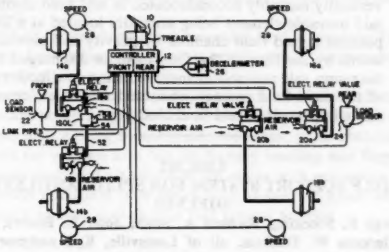
5,004,300

ELECTRONIC BRAKING SYSTEM

Malcolm Brearley, Solihull, and Richard B. Moseley, Leamington Spa, both of England, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Mar. 6, 1990, Ser. No. 489,037
Claims priority, application United Kingdom, Mar. 8, 1989, 8905311.0
Int. Cl.[5] B60T *8/32, 8/88*
U.S. Cl. 303—15 **10 Claims**

1. In a vehicle braking system in which a respective electronically controlled pressure adjustment channel having a local pressure control element is provided for each wheel, the improvement wherein, for avoiding serious brake unbalance under fault conditions which would cause either loss of braking or excessive braking at one wheel, a link pipe means connects the pressure control elements of the respective brake



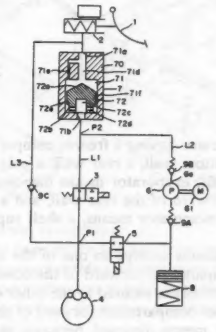
circuits associated with the two wheels at opposite ends of an axle whereby the pressure control elements are influenced in such a manner that a correctly functioning channel attempts to influence a faulty channel in such a direction as to reduce the pressure unbalance.

5,004,301

MODULATOR FOR USE IN AN ANTI-LOCK BRAKE CONTROL SYSTEM

Shinji Yamada; Teruhisa Kohno, and Koji Takata, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sep. 29, 1989, Ser. No. 414,255
Claims priority, application Japan, Sep. 30, 1988, 63-248717
Int. Cl.[5] B60T *8/42*
U.S. Cl. 303—115 **7 Claims**



1. In an anti-lock brake control system for an automobile comprising:
a master cylinder;
a main fluid passage communicating between the master cylinder and at least one wheel brake;
a recirculating passage branched off from the main fluid passage for recirculating a fluid medium back to the main fluid passage via a recirculation point located upstream of a branch point with respect to the direction of flow towards the wheel brake;
a pump disposed in the recirculating passage for recirculating the fluid medium;
a pressure adjusting means for reducing a brake pressure of the wheel brake by discharging the fluid medium from the wheel brake to the recirculating passage, and for increas-

ing the brake pressure by supplying the fluid medium through the main fluid passage to the wheel brake; and

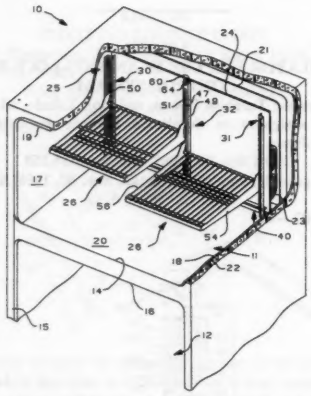
an anti-lock modulator provided with a fluid chamber formed therein, said fluid chamber having a first port communicating with the master cylinder at the upper end thereof and a second port communicating with the pump at the lower end thereof, and with a movable element vertically movably accommodated in said fluid chamber, said movable element being normally located at a lower position in said fluid chamber by gravity and moved upwards by the flow of the fluid medium discharged from the pump, said movable element reducing an effective area of the main fluid passage when said movable element is moved upwards in said fluid chamber.

5,004,302

SHELF SUPPORT SYSTEM FOR SPLIT CANTILEVER SHELVES

George E. Stocking; Richard A. Stich; John K. Besore, and Clarence W. Denham, all of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Mar. 14, 1988, Ser. No. 167,701
Int. Cl.[5] A47B *81/00*
U.S. Cl. 312—214 20 Claims



1. In a refrigerator having a freezer compartment including a top wall, a bottom wall, a rear wall, a pair of substantially parallel side walls, evaporator means disposed in the freezer compartment forward of the rear wall, and a cover disposed forward of the evaporator means, a shelf support system including:

first support means secured to one of the side walls of the freezer compartment forward of the cover;

second support means secured to the other of the side walls of the freezer compartment forward of the cover;

third support means disposed between said first support means and said second support means and forward of the cover;

each of said first support means, said second support means, and said third support means having receiving means to receive a portion of a shelf to adjustably support a shelf between said first support means and said third support means or between said second support means and said third support means;

first extending means extending between said first support means and said second support means adjacent their bottoms for supporting said third support means adjacent its bottom, said first extending means being secured to each of said first support means, said second support means, and said third support means;

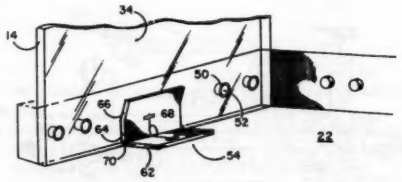
and supporting means for supporting said third support means adjacent its upper end, said supporting means being supported by at least one of the walls of the freezer compartment.

5,004,303

DISPLAY CASE

Joseph Conway, 50 Tower Rd., Newton, Mass. 02164

Filed Jan. 22, 1990, Ser. No. 468,181
Int. Cl.[5] A47F *3/00*
U.S. Cl. 312—140 7 Claims



1. A case comprising:

a display case portion having a top and side elements having tops and bottoms including channel members to retain such members together set up in a closed structure such elements adapted to be dismantled;

at least one door located within on one of said elements;

a storage case having a top, bottom and sides with an opening defined therein on one of said sides;

said storage case adapted to receive and contain said dismantled top and side elements when each is positioned therein;

said storage case further including a recess defined in its top, said recess having sides, said recess, when facing upwards, forming a base for said display case elements;

means for retaining the bottoms of said side elements to the sides of said recess for retention of said side elements when in their set-up mode;

wherein said retaining means include:

retaining members to hold the bottoms of said side elements against the sides of said recess, said retaining members including a plurality of protrusions extending from the sides of said recess and a plurality of mating apertures defined in the bottoms of said side elements, said apertures adapted to receive said protrusions;

locking means which are adapted to be positioned against the bottoms of said side elements, said locking means adapted to hold sides against the sides of said recess and said protrusions within said apertures to lock said side elements in place;

wherein said locking means comprises a plurality of structures, each adjacent said front, rear, and first and second side elements, said structure including:

a first member affixed to the base of said recess;

a second member hingeably attached to said first member;

a spring member urging said first member away from said second member; and

said second member adapted to be depressable to a downward non-engaging position and when released, to be forced by said spring against said front, rear and first and second side elements depending upon said locking means' position in said recess.

5,004,304

ARRANGEMENT FOR DISPLACEABLE SUPPORTING ARTICLES OF FURNITURE

Hans Segerpalm, Hagersten, and Ante Eklund, Vallentuna, both of Sweden, assignors to Swede Space Design AB, Stockholm, Sweden

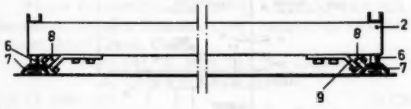
PCT No. PCT/SE88/00286, § 371 Date Nov. 13, 1988, § 102(e) Date Nov. 13, 1988, PCT Pub. No. WO88/09138, PCT Pub. Date Dec. 1, 1988

PCT Filed May 26, 1988, Ser. No. 438,425

Claims priority, application Sweden, May 26, 1987, 8702215

Int. Cl.[5] A47B *53/00*

U.S. Cl. 312—201 8 Claims



1. An arrangement for supporting an guiding articles of furniture, such an enclosed shelving systems, cabinets and the like, comprising:

(a) a pair of parallel, horizontally disposed, laterally spaced rails (3,4) disposed on a floor surface or the like, each rail having a cross-section defining a flat, horizontal upper surface (5) flanked by and integral at opposite side edges with a pair of ramp surfaces (7) sloping outwardly and downwardly toward the floor surface at an acute angle,

(b) a carriage (2) having a width at least equal to the lateral spacing between the rails, and adapted to carry the articles of furniture,

(c) a plurality of runner wheels (6) individually journalled to opposite undersides of the carriage for rolling engagement with the upper surfaces of the rails, and

(d) a plurality of guide wheels (8) individually journalled to opposite undersides of the carriage for rolling engagement with inner, facing ones of the ramp surfaces of the rails, an axis of each guide wheel extending substantially parallel to an associated one of the ramps surfaces,

(e) wherein the ramp surfaces enable the transverse passage of wheeled carriages and minimize any stumbling hazard presented by the rails.

5,004,305

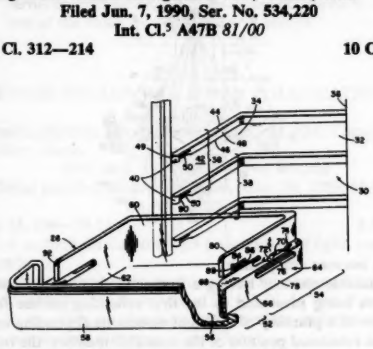
REFRIGERATOR DOOR SHELVES

Lou D. Montuoro, Cedar Rapids; Toni L. Vandarakis, Iowa City, and Richard L. Johnson, Cedar Rapids, all of Iowa, assignors to Amana Refrigeration Inc., Amana, Iowa

Filed Jun. 7, 1990, Ser. No. 534,220

Int. Cl.[5] A47B *81/00*

U.S. Cl. 312—214 10 Claims



1. Refrigerator door apparatus comprising:

a door liner having opposing side panels each comprising at least a pair of substantially horizontal ribs forming therebetween a guide channel, said guide channels facing each other from said opposing side panels;

a shelf comprising substantially horizontal side runners each adapted for being received in sliding engagement into a respective one of said guide channels wherein said shelf is substantially horizontally slidable to an inward position in said guide channels where said shelf is supported by said liner;

said shelf further comprising means for latching said shelf to said liner when said shelf is positioned at said inward position; and

at least one of said ribs having a notch and said latching means comprising a flexible finger with a tab wherein, as said shelf is being slideably inserted in said guide channels, said tab engages said one rib thereby bending said finger away from said rib until said tab aligns with said notch at which point said finer flexes back as said tab enters said notch to latch said shelf in said inward position.

5,004,306

DRAWER DEVICE

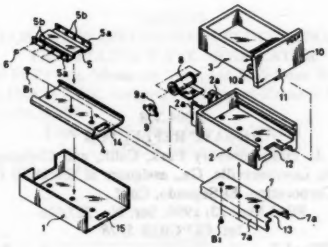
Tsutomu Oshida, Yokohama, Japan, assignor to Nifco, Inc., Yokohama, Japan

Filed Dec. 14, 1989, Ser. No. 450,482

Claims priority, application Japan, Dec. 14, 1988, 63-162024[U]

Int. Cl.[5] A47B *88/00*

U.S. Cl. 312—319 15 Claims



1. A drawer device, comprising:

a stationary case open at the top and front ends thereof;

a guide piece disposed within said stationary case and rotatably supporting a plurality of balls arranged along opposite side wall portions thereof in a reciprocating sliding direction;

a slide piece disposed within said guide piece and in contact with said balls;

a movable case fixed to said slide piece;

a front cover mounted upon said movable case;

a spring interposed between said movable case and said stationary case for biasing said movable case in an ejection direction out of said stationary case; and

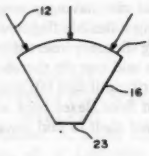
latch means for latching said front cover of said movable case to a recess defined within a front portion of said stationary case for releasably latching said movable case within said stationary case in an accommodated state and for releasing said movable case from said latched state so as to permit said movable case to be ejected from said stationary case under the influence of the biasing force of said spring.

5,004,307

NEAR FIELD AND SOLID IMMERSION OPTICAL MICROSCOPE

Gordon S. Kino, Santa Clara County, and Scott M. Mansfield, San Mateo County, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Apr. 12, 1990, Ser. No. 508,224
Int. Cl.[5] G02B *1/02, 7/02, 13/14, 21/02*
U.S. Cl. 350—1.2 6 Claims



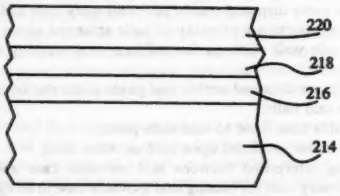
1. In an optical microscope including an objective lens closely spaced to an object to be viewed, the improvement comprising a high refractive index solid immersion lens having a spherical surface facing said objective lens and a flat front surface spaced from the spherical surface and passing through the geometrical center of the spherical surface disposed between the objective lens and the object being viewed to increase the resolution of the microscope by the factor 1/n where n is the refractive index of the solid immersion lens.

5,004,308

RUGATE REFLECTOR

Randolph L. Hall, Newbury Park, Calif., and Christopher D. Johnson, Lawrenceville, Ga., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 23, 1990, Ser. No. 527,626
Int. Cl.[5] G02B *5/28*
U.S. Cl. 350—1.7 8 Claims



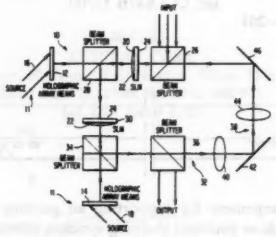
1. An optical reflector for selectively reflecting light within a predetermined range of wavelengths, comprising:
a substrate;
an absorbing layer deposited on the substrate for absorbing light within a broad range of wavelengths; and
a rugate film deposited on the absorbing layer and adapted to reflect wavelengths of light within the predetermined range.

5,004,309

NEURAL PROCESSOR WITH HOLOGRAPHIC OPTICAL PATHS AND NONLINEAR OPERATING MEANS

H. John Caulfield; Charles F. Hester; Jason M. Kinser, and Joseph Shamir, all of Huntsville, Ala., assignors to Teledyne Brown Engineering, Ala.

Continuation-in-part of Ser. No. 233,575, Aug. 18, 1988, abandoned. This application Jun. 13, 1989, Ser. No. 365,441
Int. Cl.[5] G03H *1/12*
U.S. Cl. 350—3.68 20 Claims



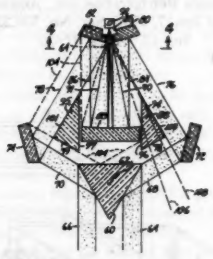
1. An apparatus for simulating a highly interconnected neural network, said apparatus comprising:
means for applying input signals;
page-oriented holographic means for providing first optical signals indicative of first predetermined interconnection weights;
first spatial light modulating means responsive to input signals from said input-signal applying means for modulating first optical signals provided by said holographic means to provide first modulated optical signals and;
means for detecting first modulated optical signals provided by said spatial light modulating means and for performing a nonlinear transformation of a parameter of said first modulated optical signals; and
means adapted to direct said detection signals to said first spatial light modulating means as input signals.

5,004,310

WIDE ANGLE LINE SCANNER

William L. McCracken, Wayland; Paul D. McDonald, Waltham, and Roger S. Kirschner, Newton, all of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 19, 1989, Ser. No. 353,977
Int. Cl.[5] G02B *26/08, 27/00*
U.S. Cl. 350—6.8 13 Claims



1. A scanner comprising:
a rotatable member having a first reflecting surface, radiation being presented to the first reflecting surface from one of a plurality of different directions depending upon the rotational position of the rotatable member, the radiation received being reflected as a first beam along a first direction;
a second member having a second reflecting surface and

mounted to receive the first beam and to reflect the radiation as a second beam along a second direction;

a third member having a third reflecting surface and mounted to receive the second beam and to reflect the radiation as a third beam;

radiation detector means mounted to receive the third beam and to produce an output in accordance with the radiation received; and

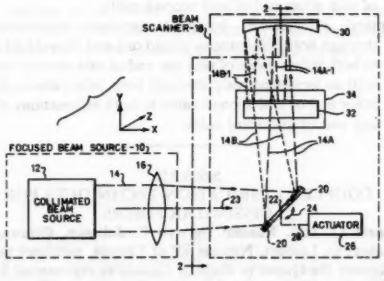
radiation blocking means mounted adjacent to both the first and second beams so as to block any radiation from reaching the detector means other than that reflected by the rotatable member from a desired one of the plurality of directions.

5,004,311

BEAM SCANNING METHOD AND APPARATUS

Norman A. Peppers, Belmont, Calif., assignor to SRI International, Menlo Park, Calif.

Filed Oct. 27, 1989, Ser. No. 428,344
Int. Cl.[5] G02B *26/08*
U.S. Cl. 350—6.9 **22 Claims**



1. A scanning system for scanning a focused beam comprising:

a focused beam source means for producing a focused radiant energy beam having a beam axis;

a cylindrical mirror upon which the focused radiant energy beam is directed and from which the beam is reflected along a reflected beam axis, the beam axis along which the focused radiant energy beam is directed onto the mirror extending substantially through the focus of said mirror; and

means for scanning the focused radiant energy beam across the cylindrical mirror for translational movement of the reflected beam axis, the focused radiant energy beam from the focused beam source being astigmatic for at least partial compensation of a focus defect produced by reflection of the beam by the cylindrical mirror.

5,004,312

METHOD FOR CONTROLLING A POLARIZATION OF LIGHT

Haruhito Shimizu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 12, 1990, Ser. No. 491,908
Claims priority, application Japan, Mar. 10, 1989, 64-58731
Int. Cl.[5] E02F *1/03*
U.S. Cl. 350—96.13 **3 Claims**

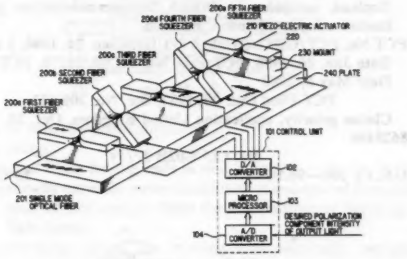
1. A method for controlling a polarization of light, comprising steps of:

generating first to fifth birefringences for a propagating light in series having main axes of 0°, 45°, 0°, 45° and 0° relative to an arbitrary direction on a surface orthogonal to a propagating direction of said light;

changing magnitude of said first to fifth birefringences to generate first to fifth phase differences ϕ_1, ϕ_2, ϕ_3, ϕ_4 and ϕ_5 corresponding thereto between each of polarizations corresponding to said main axes and each of polarizations orthogonal to said main axes; and

controlling said second to fourth phase differences ϕ_2, ϕ_3 and ϕ_4 among said first to fifth phase differences ϕ_1, ϕ_2, ϕ_3, ϕ_4 and ϕ_5 to be appropriate values, thereby transforming said propagating light having an arbitrary polarization at an input terminal to said propagating light having another arbitrary polarization at an output terminal;

wherein, in a case where one of said second to fourth phase differences ϕ_2, ϕ_3 and ϕ_4 reaches an operating limitation,



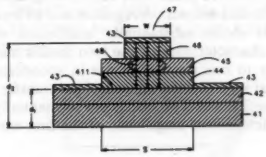
one or both of said first and fifth phase differences ϕ_1 and ϕ_5 are controlled to be appropriate values along with remaining two phase differences among said second to fourth phase differences ϕ_2, ϕ_3 and ϕ_4, and said one of said second to fourth phase difference ϕ_2, ϕ_3 and ϕ_4 is then restored to be inside an operating range by an arbitrary value, so that said controlling of said second to fourth phase differences ϕ_2, ϕ_3 and ϕ_4 restarts to provide said propagating light having said another arbitrary polarization at said output terminal.

5,004,313

LOW LOSS, LOW DISPERSION VELOCITY-MATCHED TRAVELLING WAVE MODULATOR

Michael R. Ty Tan, Mountain View, and Shih-Yuan Wang, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 1, 1988, Ser. No. 280,101
Int. Cl.[5] G02B *6/10*; G02F *1/01*
U.S. Cl. 350—96.14 **8 Claims**



1. A travelling wave modulator comprising:

a substrate:

a semiconducting, electrooptic waveguide, formed on a first side of said substrate, for propagating a travelling wave optical signal of phase velocity v_o;

a pair of electrodes, consisting of a first electrode and a second electrode, located on the same side of said substrate as is formed said waveguide, formed parallel to said waveguide and positioned such that an electrical travelling wave signal travelling along said electrodes with a phase velocity v_m produces an electrical field that penetrates through said waveguide;

on the same side of said substrate as are formed said pair of

electrodes, at least one intentionally doped conducting layer;

the conductivity of said at least one intentionally doped conducting layer being selected to adjust the difference between V_m and V_O so that a figure of merit of the modulator is optimized.

5,004,314

OPTICAL SIGNAL MODULATION DEVICE

Richard C. Booth, Woodbridge; Alan R. Beaumont, Ipswich; Barbara E. Daymond-John, Woodbridge; David G. Cunningham, Felixstowe, and William A. Stallard, Colchester, all of England, assignors to British Telecommunications public limited company, London, England

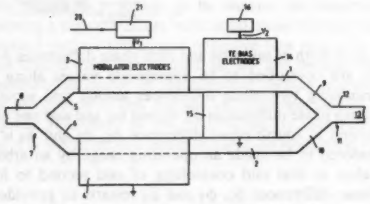
PCT No. PCT/GB87/00738, § 371 Date Jun. 24, 1988, § 102(e) Date Jun. 24, 1988, PCT Pub. No. WO88/03278, PCT Pub. Date May 5, 1988

PCT Filed Oct. 20, 1987, Ser. No. 209,622

Claims priority, application United Kingdom, Oct. 24, 1986, 8625486

Int. Cl.[5] G02B *5/174*

U.S. Cl. 350—96.14 **15 Claims**



1. An optical signal modulation device comprising:

first and second optical waveguides connected at one ends thereof to an optical signal splitting device which couples portions of an incoming optical signal into the waveguides and at the other ends thereof to an optical signal combining device which causes optical signals received from the waveguides to interfere;

first modulating means responsive to a first control signal for causing a relative phase shift between signals in the first and second optical waveguides, the first modulating means causing relative phase shifts in both TM mode and TE mode signals; and

second modulating means responsive to a bias signal, for causing a relative phase shift between signals of one mode in the first and second waveguides and to leave signals of the other mode substantially unaffected whereby the transfer characteristics of the two modes may be shifted relatively to one another in use in accordance with the bias signal such that the minima of the transfer characteristics of the TE and TM modes are substantially coincident at a predetermined magnitude of the first control signal.

5,004,315

OPTICAL CABLE AND OPTICAL CABLE LINE

Hiroshi Miyazaki, Ichihara, Japan, assignor to Furukawa Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 663,491, Oct. 22, 1984, abandoned. This application Jun. 25, 1990, Ser. No. 542,797

Claims priority, application Japan, Oct. 20, 1983, 58-196914

Int. Cl.[5] G02B *6/26, 6/42*

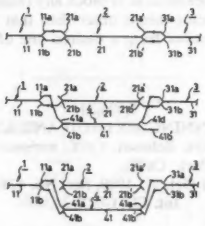
U.S. Cl. 350—96.15 **1 Claim**

1. An optical cable line comprising:

at least three optical cables, each of said cables having two opposite ends and being continuous between said two ends, and each of said two ends being bifurcated to form continuous core wires centrally located between said two ends,

a first bifurcation of one end of a first cable of said cables being connected to a first bifurcation of one end of a second cable of said cables and a second bifurcation of said one end of said first cable being connected to a second bifurcation of said one end of said second cable,

a first bifurcation of one end of a third cable of said cables being connected to a first bifurcation of the other end of said second cable and a second bifurcation of said one end



of said third cable being connected to a second bifurcation of said other end of said second cable,

optical information being transmitted simultaneously through both bifurcations of said one end of said first cable to both bifurcations of said one end of said second cable as well as simultaneously through both bifurcations of said other end of said second cable to both bifurcations of said one end of said third cable.

5,004,316

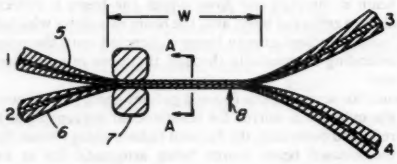
COUPLER FABRICATION TECHNIQUES FOR DISSIMILAR FIBERS

Kenneth O. Hill, Kanata; Derwyn C. Johnson, Ottawa, and Robert G. Lamont, Nepean, all of Canada, assignors to Her Majesty the Queen in Right of Canada as represented by the Minister of Communications, Ottawa, Canada

Filed Jan. 9, 1986, Ser. No. 817,507

Int. Cl.[5] G02B *6/26*

U.S. Cl. 350—96.15 **3 Claims**



1. A fused twin biconical taper fiber optic splitter comprised of a pair of monomodal or quasi monomodal optical fibers hard fused at respective narrowed waists, the index of refraction of the cladding of one fiber being different from the index of refraction of the cladding of the other, whereby coupling from one fiber to the other can be obtained at a predetermined wavelength or band of wavelengths depending on the refractive indexes and biconical tapers of the splitter.

5,004,317

WIRE BOND CONNECTION SYSTEM WITH CANCELLATION OF MUTUAL COUPLING

Kenneth P. Jackson, Danbury, Conn., and Norman Raver, Yorktown Heights, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jan. 3, 1990, Ser. No. 460,418

Int. Cl.[5] G02B *6/36*; H08K *1/18*

U.S. Cl. 350—96.20 **4 Claims**

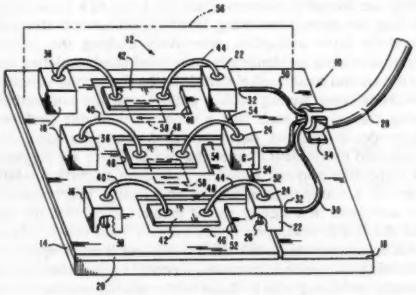
4. An electro-optical transmitter for the generation and transmission of optical signals via optical fibers, the system

including an array of solid-state lasers positioned for applying light to the optical fibers, an array of laser driver modules electrically connected to said lasers for exciting the lasers to generate light signals, the lasers and the drivers constituting an electrical circuit; and

wherein in said electrical circuit, said drivers and said lasers are mounted on a circuit board having an electrically conductive cladding, the electrical circuit including a system for interconnecting the drivers to the lasers via parallel signal channels with prevention of crosstalk among the channels;

said interconnection system comprises a plurality of wire segments arranged side-by-side and spaced apart in an array, each of said wire segments having a first end and a second end, the first ends of the wire segments being connection to a first terminal in each of respective ones of said lasers;

a plurality of electrically conductive pads arranged side-by-side in a plane of said cladding and spaced apart in an array facing said array of wire segments, each of said pads being surrounded by an insulating border insulating the pad from the cladding, each of said pads having a first end portion and a econd end portion opposite the first end portion, the second end portions of said pads being connected to a first terminal in each of said drivers;



an array of conductive strips formed in said cladding and located in said cladding plane between successive ones of said pads, said borders being separated from each other by said conductive strips, said conductive strips extending from said lasers to said drivers to provide electrical connection between a second terminal in each of said lasers and a second terminal in a corresponding one of each of said drivers; and

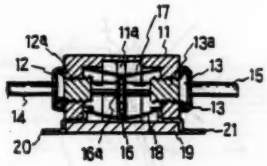
wherein the second ends of said wire segments are connected to the first end portions in respective ones of said pads for communicating signals in respective ones of said signal channels, each of said wire segments forming a first partial loop disposed in a plane perpendicular to said cladding plane, the first loops providing magnetic coupling with a first mutual inductance among successive ones of said wire segments, there being segments of said borders contiguous said strips, each of said border segments defining a second partial loop parallel to said cladding plane in respective ones of said signal channels, the second loops providing magnetic coupling with a second mutual inductance among successive ones of said pads, the second mutual inductance tending to cancel the first mutual inductance for prevention of crosstalk among said signal channels.

5,004,318

SMALL OPTICAL FIBER SWITCH

Shigeo Ohashi, Tokyo, Japan, assignor to Nihon Kaiheiki Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 30, 1990, Ser. No. 472,104
Claims priority, application Japan, Sep. 6, 1989, 1-104710
Int. Cl.[5] G02B *6/26, 6/34*
U.S. Cl. 350—96.20 **9 Claims**



1. A small swtich comprising

a casing,

optical fibers having ends in said casing,

vertically movable means positioned at and spaced from said ends of said optical fibers for transmitting or blocking a light beam,

positioning means for moving said vertically movable means,

said positioning means having first and second ends connected to a power source so that electricity may be transmitted through said positioning means thereby changing the position of said positioning means and vertically moving said vertically movable means, and

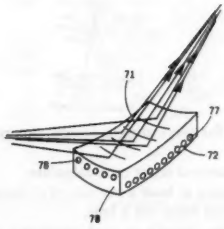
resilient means for positioning said vertically movable means in an initial position.

5,004,319

CRYSTAL DIFFRACTION LENS WITH VARIABLE FOCAL LENGTH

Robert K. Smither, Hinsdale, Ill., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Dec. 29, 1988, Ser. No. 291,916
Int. Cl.[5] G02B *26/00, 27/44, 5/18;* G21K *1/06*
U.S. Cl. 350—162.21 **19 Claims**



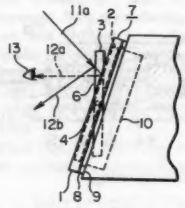
1. A focusing element having a pair of opposite major surfaces separated from each other, the improvement comprising means for altering the focal length of said focusing element to provide a focusing element with any one of a plurality of predetermined focal lengths, said means including means for changing heat transfer in selected portions of said major surfaces by controlled quantities.

5,004,320

ANTI-REFLECTION DEVICE FOR A VDT

Takao Nagai, and Hiromi Kusano, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 5, 1988, Ser. No. 279,798
Claims priority, application Japan, Dec. 10, 1987, 62-314617
Int. Cl.[5] G02B *27/00*
U.S. Cl. 350—276 R 17 Claims



12. An anti-reflection device for a visual display terminal comprising:

an inner frame rotatably supported by a visual display terminal for rotation about a non-horizontal axis; and

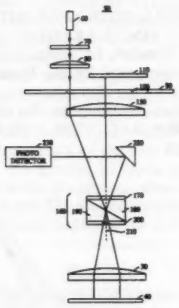
an anti-reflection film mounted on the inner frame.

5,004,321

RESOLUTION CONFOCAL MICROSCOPE, AND DEVICE FABRICATION METHOD USING SAME

Martin Feldman, Berkeley Heights, and Princess E. Simpson, Plainfield, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 28, 1989, Ser. No. 387,248
Int. Cl.[5] G02B *21/00*; G03C *5/00*
U.S. Cl. 350—320 3 Claims



1. A method for fabricating a device, comprising the steps of:

forming a patterned resist on a substrate;

optically imaging at least a portion of at least one feature in said patterned resist via a lens;

transferring the pattern in said patterned resist into said substrate and

completing the fabrication of said device in said substrate wherein

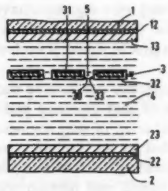
said imaging step includes the substeps of passing the same light beam through said lens three or more times to impinge two or more different regions of said feature with said light beam.

5,004,322

METHOD OF MANUFACTURING AN IMPROVED ELECTROSCOPIC FLUID DISPLAY

Antonius G. H. Verhulst; Jacob Bruinink, and Emanuel J. W. M. Lenders, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 191,298, May 6, 1988, Pat. No. 4,923,283.
This application Jan. 24, 1990, Ser. No. 469,130
Claims priority, application Netherlands, May 7, 1987, 8701072
Int. Cl.[5] G02B *27/00, 26/02*
U.S. Cl. 350—320 7 Claims



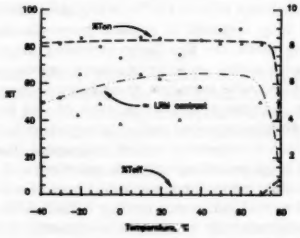
1. A method of manufacturing an electroscopic fluid display by providing a first structured electrode layer on a lower substrate; providing a first insulating layer on the lower substrate which is provided with the first structured electrode layer; providing a polymer layer on the first insulating layer; providing a second insulating layer on the polymer layer; providing a second structured electrode layer on the second insulating layer; selectively etching the second insulating layer using the second structured electrode layer as a mask; underetching the second insulating layer via the second structured electrode layer and, thus, selectively etching the polymer layer; providing an identically structured third insulating layer on the second structured electrode layer, the second structured electrode layer having such a pattern and the underetching being carried out such that a series of rotatable perforated electrodes is obtained, said perforated electrodes being interconnected by resilient connecting pieces which are supported by respective polymer supports; providing a fourth insulating layer on a transparent substrate; and finally, interconnecting the substrates in a tightly sealed manner, such that the third and the fourth insulating layers contact each other, wherein prior to underetching, the third insulating layer is applied by anodizing the second structured electrode layer, thus simultaneously providing side surfaces of the second structured electrode layer with insulating material.

5,004,323

EXTENDED TEMPERATURE RANGE POLYMER DISPERSED LIQUID CRYSTAL LIGHT SHUTTERS

John L. West, Monroe Falls, Ohio, assignor to Kent State University, Kent, Ohio

Filed Aug. 30, 1988, Ser. No. 238,551
Int. Cl.[5] G02F *1/13*
U.S. Cl. 350—346 22 Claims



5. An extended temperature range polymer dispersed liquid

crystal light shutter electrically switchable between a transmissive and an opaque state over a working temperature range of about −40° C. to about 100° C., said shutter including a polymer-dispersed liquid crystalline material comprising a highly cross-linked transparent matrix having phase-separated microdroplets of liquid crystal dispersed therein, the liquid crystal capable of existing in a supercooled liquid crystalline state at temperatures below its freezing point.

5,004,324

LIQUID CRYSTAL DISPLAY

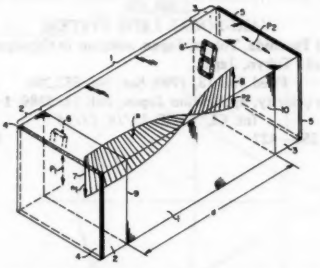
Frans Leenhouts, Kaiseraugst, and Martin Schadt, Seltisberg, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 356,564, May 24, 1989, abandoned, which is a continuation of Ser. No. 94,572, Sep. 9, 1987, abandoned. This application Jan. 18, 1990, Ser. No. 465,593

Claims priority, application Switzerland, Sep. 12, 1986, 3671/86

Int. Cl.[5] G02F *1/13*

U.S. Cl. 350—347 R **9 Claims**



1. A liquid crystal display (LCD) cell having a high mulitplex ratio, short switching time and a display picture which is relatively unaffected by variations in plate spacing of the LCD cell, said LCD cell comprising:

a highly twisted nematic liquid crystal layer having a positive dielectric anisotropy Δn, a pitch P and a twist angle ϕ having an absolute value in a range between about 160° and about 260° for a right-hand twist or left-hand twist;

a front plate located in front of the liquid crystal layer, said front plate including an inward surface contacting the liquid crystal layer, the inward surface having a surface orientation and also including first electrode means;

a rear plate located rearward of the liquid crystal layer, said rear plate including an inward surface contacting the liquid crystal layer, the inward surface having a surface orientation and also including second electrode means;

a front polarizer located in front of aid front plate, said front polarizer having a polarization direction; and

a rear polarizer located rearward of said rear plate, said rear polarizer having a polarization direction;

wherein,

an angle ϕ between the surface orientation of the inward surface of the front plate and the polarization direction of the front polarizer is within the range of 0° to 360°;

an angle ψ between the polarization direction of the front polarization and the polarization direction of the rear polarizer is in the range of about 0° to about 180°;

said front and rear plates are spaced apart by an optical path difference of Δn·d in the range of about 0.4 to about 0.6 μm which produces a substantially low inherent color in the LCD cell so that a neutral display is achieved; and a ratio d/P of plate spacing d to pitch P is in the range of about 0.2 to about 0.8.

5,004,325

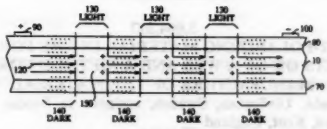
OPTICAL PROCESSING USING A MULTILAYER HETEROSTRUCTURE

Alastair M. Glass; Wayne H. Knox, both of Rumson, N.J., and David D. Nolte, West Lafayette, Ind., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 16, 1990, Ser. No. 465,274

Int. Cl.[5] G02F *1/01*

U.S. Cl. 350—354 **11 Claims**



1. Apparatus comprising:

a photoconductive, photorefractive medium;

means for illuminating the medium with spatially varying electromagnetic radiation; and

means adapted for forming an applied electric field within the medium,

characterized in that

the medium comprises a semi-insulating, monolithic, multilayer heterostructure having at least four layers;

the heterostructure has a lateral extent greater than its thickness; and

the heterostructure has an areal distribution of deep levels, capable of localizing photocarriers, over essentially all of its lateral extent, such that when spatially varying electromagnetic radiation of a suitable wavelength is absorbed by the medium, photocarriers are localized by the deep levels, causing a spatially varying internal electric field and a spatially varying distribution of refractive index variations within the medium.

5,004,326

MAGNETO-OPTICAL INFORMATION REPRODUCING APPARATUS HAVING A POLARIZING BEAM SPLITTER DISPOSED WITH AN INCLINATION OF 45 DEGREES

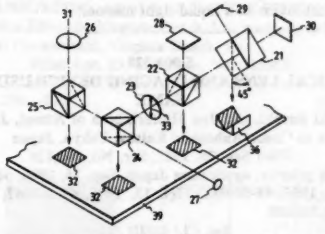
Kenichi Sasaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 2, 1989, Ser. No. 317,958

Claims priority, application Japan, Mar. 3, 1988, 63-48772

Int. Cl.[5] G02F *1/29*

U.S. Cl. 350—375 **21 Claims**



15. A magneto-optical information reproducing apparatus comprising:

means for applying a light beam polarized in a predetermined direction to a recording medium on which information is magnetically recorded;

first dividing means for dividing the reflected or transmitted light beam from the medium modulated into a polarized state in conformity with the information by the magneto-optical effect into two light beams polarized in directions orthogonal to each other, said first dividing means being

disposed so that the directions of polarization of the divided two light beams form an angle of 45° with respect to the predetermined direction of polarization of the applied light beam;

detecting means for detecting the divided two light beams; and

second dividing means for dividing part of the light beam before entering said first dividing means, said second dividing means being integrally formed with said first dividing means.

5,004,327

LIGHT-POLARIZING MATERIAL IN THE FORM OF SHEETS OR OF A WEB AND A METHOD FOR THE MANUFACTURE OF THE MATERIAL

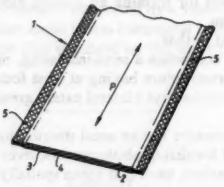
Ake Rosén, Ulvögatan, Sweden, assignor to Svecia Antiqua Limited, Kent, England

Filed Nov. 30, 1988, Ser. No. 277,703

Claims priority, application Sweden, Dec. 1, 1987, 8704791

Int. Cl.[5] G02B *1/08, 5/30*

U.S. Cl. 350—398 **3 Claims**



1. A light-polarizing element for use in a security document to permit authentication of the security document, comprising:

a layer of water-absorbing polymer material that contains polarizing crystals, said polarizing crystals being absorbed in the water-absorbing polymer material and being oriented in a predetermined direction by mechanical stretching of the water-absorbing polymer layer, said layer of water-absorbing polymer material being manufactured from polyvinyl alcohol and containing between about 1% and 4% iodine and between about 37% and 39% water, wherein the percentages are based on the total weight of the polymer, said polarizing crystals being water-soluble iodine crystals; and

two outer transparent layers of thermoplastic material, said layer of water-absorbing polymer material being laminated between said two outer transparent layers with edge zones of one of said two outer transparent layer being sealed to edge zones of the outer of said two outer transparent layers in a liquid-tight manner.

5,004,328

SPHERICAL LENS AND IMAGING DEVICE USING THE SAME

Masayuki Suzuki, and Jun Hattori, both of Atsugi, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1987, Ser. No. 103,126

, Claims priority, application Japan, Sep. 26, 1986, 61-229083; Oct. 13, 1986, 61-243686; Oct. 13, 1986, 61-243687; Oct. 13, 1986, 61-243688

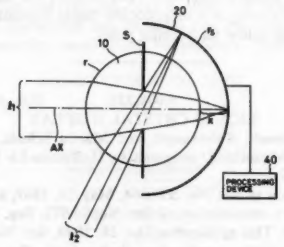
Int. Cl.[5] G02B *3/00*

U.S. Cl. 350—416 **16 Claims**

1. An imaging system comprising:

a spherical lens with a curved image plane formed by a spherical shell-shaped lens composed of a medium with a refractive index n_1 and a sphere-shaped lens composed of a medium with a refractive index n_2 that is smaller than n_1 ($n_2 < n_1$) and positioned inside said spherical shell-shaped lens to constitute a concentric sphere therewith;

imaging means having a light-receiving surface curved along the curved image plane of said spherical lens and adapted to pick-up the image formed by said spherical lens with said light-receiving surface, wherein said spherical lens and imaging means are mutually movable along the optical axis; and



processing means for processing image signals output from said imaging means.

5,004,329

VARI-FOCAL LENS SYSTEM

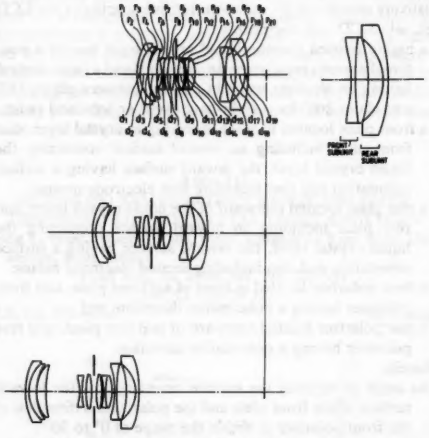
Hirofumi Tsuchida, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1990, Ser. No. 552,296

Claims priority, application Japan, Jul. 14, 1989, 1-180180

Int. Cl.[5] G02B *15/14, 13/18*

U.S. Cl. 350—427 **12 Claims**



1. A vari-focal lens system comprising a plurality of lens units including a rearmost lens unit having a negative refracting power, said negative lens unit comprising, in the order from the object side, of a front subunit comprising a negative lens element and a positive lens element and a rear subunit comprising at least one negative lens element arranged with an airspace reserved from said front subunit, and said negative lens unit comprising at least one aspherical surface having negative refractive power weakened from the optical axis

toward the marginal portion thereof, and said vari-focal lens system satisfying the following conditions (1), (2) and (3):

$$-8<\phi_N/\phi_T<-3 \quad (1)$$

$$-0.2<\phi_F/\phi_N<0.5 \quad (2)$$

$$0.5<\phi_B/\phi_N<1.2 \quad (3)$$

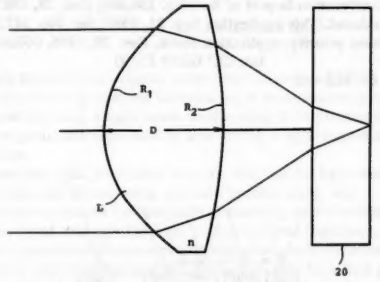
wherein the reference symbol ϕ_N represents the refractive power of said negative lens unit, the reference symbol ϕ_F designates the refractive power of said front subunit, the reference symbol ϕ_B denotes the refractive power of said rear subunit and the reference symbol ϕ_T represents the refractive power of said vari-focal lens system as a whole at the tele position thereof.

5,004,330

ASPHERICAL GLASS LENS ELEMENT FORMED BY A LOW DISPERSION GLASS MATERIAL

Isao Ishibai, and Hitonobu Otsu, both of Tokyo, Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Mar. 16, 1990, Ser. No. 494,983
Claims priority, application Japan, Mar. 17, 1989, 1-66846
Int. Cl.[5] G02B *13/18*
U.S. Cl. 350—432 **5 Claims**



1. An aspherical lens element which is formed by a glass material and which has an optical axis, a focal length f, a thickness D along said optical axis, and first and second aspherical convex surfaces, said first and said second aspherical convex surfaces having first and second apexes through which said optical axis passes, first and second radii r_1 and r_2 of curvature at said first and said second apexes, and first and second coefficients k_1 and k_2 of cones, respectively, and being determined by first and second predetermined formulae, respectively, wherein each of said first and said second formula are given by:

$$z_i=[C_iY^2/[1+(1-(1+K_i)C_i^2Y^2)^{\frac{1}{2}}]]+E_iY^4+F_iY^6+G_iY^8+H_iY^{10},$$

where i takes 1 and 2 corresponding to said first and said second convex surfaces, respectively; Y is representative of an incident height from the optical axis; z_i is representative of a distance between a point placed on an i-th convex surface of said first and said second convex surfaces at the incident height Y and a tangential plane which is tangential to said i-th convex surface at the apex of said i-th convex surface; C_i is representative of curvature of the apex of said i-th convex surface and is equal to a reciprocal of each radius r_i; k_i is representative of a coefficient of cone of said i-th convex surface; E_i, F_i, G_i, and H_i are representative of aspherical coefficients of said i-th convex surface which are proportional to fourth, sixth, eighth, and tenth power of the incident height Y, respectively;

said aspherical lens element being defined by:

$1.5<(f/D)<1.9,$

$-0.4<(r_1/r_2)<-0.2,$

and

$10<k_1\cdot k_2-1000E_1<30,$

said glass material being specified by:

$1.44<n<1.55,$

and

$75<\nu<90,$

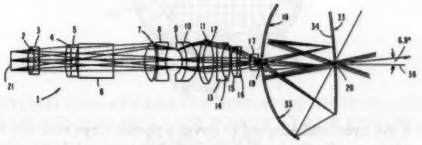
where n is representative of a refractive index of said glass material and ν an Abbe number of said glass material.

5,004,331

CATADIOPTRIC PROJECTOR, CATADIOPTRIC PROJECTION SYSTEM AND PROCESS

Eric C. Haseltine, Manhattan Beach, and Helene H. Jones, Culver City, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 3, 1989, Ser. No. 347,111
Int. Cl.[5] G02B *17/00, 5/10, 27/14*
U.S. Cl. 350—443 **10 Claims**



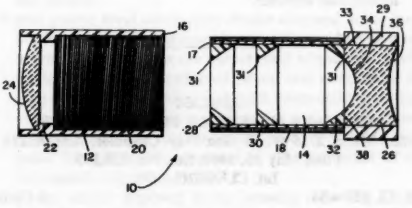
1. A catadioptric projector for producing areas-of-interest displays having resolution of substantially less than 10 arc minutes per line and including: entrance pupil means for receiving beams of substantially collimated light; means for imaging said entrance pupil means onto an opening in the surface of aspheric mirror means, said means for imaging being linked to said entrance pupil means; aspheric mirror means linked to said means for imaging and including an opening for transmitting light received from said means for imaging; and spherical mirror means having an opening for receiving and for transmitting light from said aspheric mirror means.

5,004,332

TELEMICROSCOPE WITH AT LEAST ONE LIGHT ABSORBING ANNULAR BAFFLE FITTING

D. Brandon Edwards, Virginia Beach, Va., assignor to Edwards Optical Corporation, Virginia Beach, Va.

Filed Apr. 25, 1989, Ser. No. 343,030
Int. Cl.[5] G02B *21/20, 23/18, 7/04, 9/10*
U.S. Cl. 350—453 **20 Claims**



1. A telemicroscope comprising:

a tubular barrel having an inner diameter of less than about 16.0 millimeters;

a front lens and a rear lens fitted to the tubular barrel;

an aperture stop and a field stop between the front lens and rear lens; and

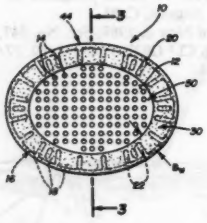
at least one light absorbing annular baffle fitting within the circumference of the tubular barrel and being positioned between the aperture stop and the field stop, the baffle having an outer diameter substantially equal to the inner diameter of the tubular barrel, and having an inner surface which tapers to an inner edge.

5,004,333

INTEGRALLY FORMED TWO-PIECE EYESHIELD

Daniel E. Bruhl, Jr., Fort Worth, Tex., assignor to Trident Medical Products, Inc., Ft. Worth, Tex.

Filed Jul. 28, 1989, Ser. No. 386,276
Int. Cl.[5] G02C *7/16*; A61F *3/00*
U.S. Cl. 351—45 **12 Claims**



1. An eyeshield adapted to cover a person's eye after the eye has been medically treated, such that the eye might be physically protected while the eye is healing, comprising:

a. a relatively thin but substantially firm and foraminous member having a concave interior surface adapted to be juxtaposed with a person's eye so as to vault the eye and shield it from contact with errant bodies until such time as the eye has healed, and said foraminous member having a thickness as measured from its frontal and exterior surface to its rearward and interior surface, and also having a peripheral edge formed from generally curved segments, and said foraminous member having a plurality of discrete apertures of a sufficient quantity and size as to foster sight and to foster ventilation of both the eye and the facial area immediately surrounding said eye; and

b. a relatively thick border member mounted around the peripheral edge of said foraminous member so as to envelop the same, said border member being integrally molded in contact with said foraminous member so as to be permanently affixed thereto, and said border member having an average thickness that is substantially greater than the average thickness of said foraminous member, and the border member being significantly softer than the foraminous member.

5,004,334

AUXILIARY NOSEPIECE FOR EYEGLASSES

Nadine Miele, 2725 W. El Alba Way, Chandler, Ariz. 85224

Filed May 25, 1990, Ser. No. 528,539
Int. Cl.[5] G02C *7/06*
U.S. Cl. 351—54 **6 Claims**

1. In a pair of eyeglasses having a frame and a first nosepiece for supporting said eyeglasses on a user's nose, an auxiliary nosepiece comprising mounting structure mounting said auxiliary nosepiece on said frame and a second nosepiece attached to said mounting structure and extending in a direction opposite to a direction of extension of said first nosepiece, whereby

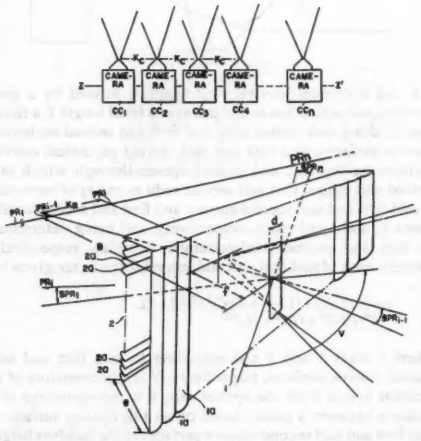
said eyeglasses may be supported with said second nosepiece engaging said user's nose in an upside down configuration.

5,004,335

SYSTEM FOR REPRODUCING THREE-DIMENSIONAL, THAT IS FOUR-DIMENSIONAL, IMAGES AND, PARTICULARLY MOVING IMAGES BY PROJECTION, WITHOUT THE USE OF COHERENT LIGHT

Juan D. Montes, Urbanizacion Las Cabanas II, Chalet No. 9 Las Rozas, Madrid, Spain

Continuation-in-part of Ser. No. 138,665, Dec. 28, 1987, abandoned. This application Sep. 21, 1988, Ser. No. 247,368
Claims priority, application Spain, Dec. 29, 1986, 8603612
Int. Cl.[5] G03B *35/00*
U.S. Cl. 352—58 **19 Claims**



1. In a system for reproducing images three-dimensionally, the system having first projectors spaced from each other a first distance along a horizontal line, the first projectors being for projecting the images, the images being from respectively corresponding cameras spaced along a horizontal line, this projecting of the images being over a second distance onto an optical member from which the images are observed, the improved optical member comprising:

first optical sheet means comprising vertical cylindric lenses, the aperture of each vertical cylindric lens being at least equal to a first value of the quotient obtained by dividing

the first distance by the second distance and less than twice the first value for providing the images with horizontal parallax; and

second optical sheet means comprising lens means for vertically expanding the images provided by the first optical sheet means.

5,004,336

TRANSMISSIVE ORIGINAL PROJECTING APPARATUS

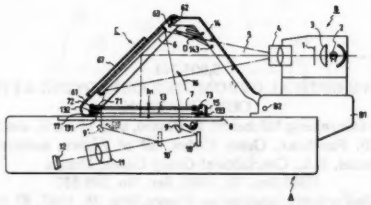
Yasutsugu Saijo, Tokyo; Kazuyoshi Chiku, and Shigeyoshi Onoda, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1989, Ser. No. 404,519

Claims priority, application Japan, Sep. 8, 1988, 63-223568; Sep. 16, 1988, 63-231935; Sep. 22, 1988, 63-238195; Dec. 8, 1988, 63-159013[U]

Int. Cl.[5] G03B *21/00*

U.S. Cl. 353—122 **63 Claims**



1. A transmissive original projecting apparatus having:

an illuminating unit for illuminating a transmissive original and emitting a light beam conforming to the transmissive original, said illuminating unit having a light source and a lens;

a parallel light projection lens for making the light emitted from said illuminating unit into parallel light; and

connecting means for integrally connecting said illuminating unit and said parallel light projection lens together,

said connecting means movably supporting said illuminating unit, said illuminating unit being movable to a first position for forming a projection optical path to said parallel light projection lens and a second position in which said illuminating unit is contained in said projection optical path side.

5,004,337

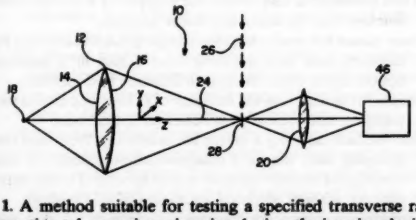
MODIFIED FOUCAULT FOR TESTING AN IMAGING DEVICE IN TERMS OF THE ENCIRCLED ENERGY TEST

Thomas W. Dey, Springwater, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 31, 1990, Ser. No. 531,988

Int. Cl.[5] G01B *9/00*

U.S. Cl. 356—124 **5 Claims**



1. A method suitable for testing a specified transverse ray aberration tolerance in an imaging device, the imaging device being tested in a modified Foucault knife-edge test assembly, which assembly comprises:

(a) an imaging device to be tested;

(b) a source of radiation energy that can be directed along a reference axis to the imaging device;

(c) a photodetector aligned on the source reference axis, for detecting and measuring the radiation energy imaged by the imaging device; and

(d) a knife-edge capable of being positioned in a series of knife-edge position steps, for cutting the radiation imaged by the imaging device, thereby producing a variable radiation energy function, as measurable by the photodetector, the knife-edge comprising a substrate comprising an opaque region;

the method comprising the steps of:

(1) normalizing energy radiation levels of the assembly;

(2) positioning the knife-edge opaque region in three degrees of freedom, for reducing the radiation energy measured by the photodetector;

(3) positioning the knife-edge opaque region in three degrees of freedom, until the photodetector measures a minimum radiation energy; and

(4) comparing the step 3 minimum energy against a test specification value.

5,004,338

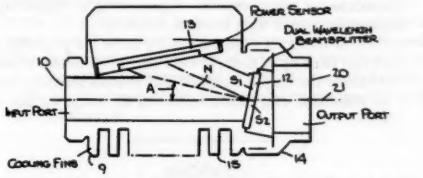
METHOD AND APPARATUS FOR ATTENUATION AND MEASUREMENT OF LASER POWER AT THE END OF A LASER GUIDE

Clifford E. Morrow, 576 Hatchery Rd., North Kingstown, R.I. 02852

Filed Mar. 1, 1989, Ser. No. 317,575

Int. Cl.[5] G01J *1/04*; A61B *17/36*; B23K *26/02*

U.S. Cl. 356—218 **18 Claims**



1. Apparatus for providing accurate delivery and measurement of low levels of laser power at the end of a laser guide comprising:

a housing disposed at the end of the laser guide having an input and an output, said input receiving an input laser beam of a higher level of laser power than is provided at the output;

a laser power level attenuation device disposed in the housing for attenuating the input beam and providing an attenuated output beam to the output, said attenuation device further providing a reflected beam, said attenuation device comprising a duel wavelength beam splitter for providing said attenuated output beam and reflecting said reflected beam and further for transmitting a visible guide beam for guiding an operator in the placement of the attenuated output beam; and

a power sensor disposed in the housing receiving the reflected beam for measuring a power level of the reflected beam, thus providing a measurement related to the power level of the output beam, said power sensor further absorbing the energy of said reflected beam.

5,004,339

METHOD AND APPARATUS FOR DETERMINING PHYSICAL CHARACTERISTICS OF OBJECTS AND OBJECT SURFACES

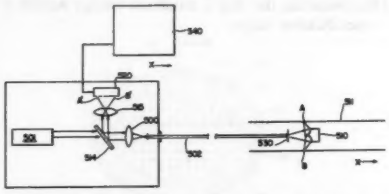
Timothy R. Pryor; Omer L. Hageniers; Walter J. Pastorius; Nicholas Liptay-Wagner, and Donald A. Clarke, all of Windsor, Canada, assignors to Diffracto Ltd., Windsor, Canada

Continuation of Ser. No. 820,922, Jan. 21, 1986, abandoned, which is a continuation of Ser. No. 735,609, May 20, 1985, abandoned, which is a continuation of Ser. No. 592,360, Mar. 22, 1984, abandoned, which is a continuation of Ser. No. 295,622, Aug. 24, 1981, Pat. No. 4,506,980, which is a continuation of Ser. No. 15,792, Feb. 27, 1979, Pat. No. 4,305,661. This application Dec. 22, 1986, Ser. No. 943,844

The portion of the term of this patent subsequent to Dec. 15, 1998, has been disclaimed.

Int. Cl.[5] G01B *21/88*

U.S. Cl. 356—241 5 Claims



1. Apparatus for determining a characteristic of the inside surface of a bore comprising:

a guided wave fiber optic element capable of insertion into a bore;

a laser light source for directing light onto the proximal end of said fiber optic element;

means for directing light emanating from the distal end of said fiber optic element onto the inside surface of said bore and for directing light reflected from the inside surface of said bore onto the distal end of said fiber optic element; and

photodetector means capable of generating an output signal dependent upon light incident thereon;

means for directing light emanating from the proximal end of said fiber optic element onto said photodetector means whereby the output signal of said photodetector provides an indication of a characteristic of an inside surface of a bore.

5,004,340

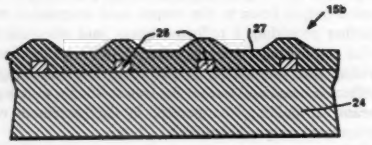
CALIBRATION TARGET FOR SURFACE ANALYSIS SCANNER SYSTEMS

Barclay J. Tullis, Palo Alto, and James B. Kruger, Half Moon Bay, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 27, 1988, Ser. No. 186,879

Int. Cl.[5] G01N *21/88*

U.S. Cl. 356—243 11 Claims



1. A calibration target which reduces the amount of light scattered by particles contaminating the target's surface, for use with a surface analysis scanner of the type which detects particles adjacent to a surface by scanning a beam of monochromatic light across the surface and detecting light which is scattered by such adjacent particles, said target comprising:

a calibration target substrate having an upper surface;

an antireflectance film coating at least a portion of the upper surface of the calibration target substrate; and

a plurality of reference features interposed between the upper surface of the calibration target substrate and the antireflectance film,

wherein light from a surface analysis scanner which impinges upon the upper surface of the target is not substantially scattered by particles contaminating the target surface so that such contaminating particles are not detected by the surface analysis scanner and

wherein the antireflectance film and the reference features are of such indices of refraction and thicknesses so as to produce maximum reflectance of the scanning beam from said features.

5,004,341

ACTIVE OPTICAL GYROMETER EMPLOYING A PHASE CONJUGATION

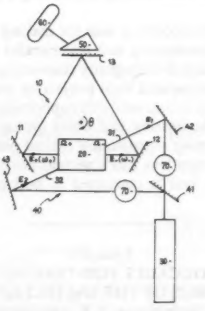
Gilbert Grynberg; Michel M. E. Pinard, both of Paris, and Marc A. F. Faucheux, Orsay Cedex, all of France, assignors to Quantel, S.A., Courtabouf-Orsay Cedex, France

Filed Sep. 26, 1988, Ser. No. 249,557

Claims priority, application France, Sep. 25, 1987, 87 13321

Int. Cl.[5] G01C *19/64*

U.S. Cl. 356—350 15 Claims



1. An active conjugation ring gyrometer with an optical bias, comprising:

three main mirrors arranged so as to form a closed geometrical path therebetween, a resonant cavity being defined within said closed geometrical path;

a cell mounted in said cavity and containing a non-photorefractive type optically non-linear medium;

laser means for producing two pumping laser beams and for directing said two pumping laser beams in a colinear, oppositely directed manner to irradiate said medium;

means for modulating the intensity of at least one of said two pumping laser beams to produce an optical bias;

said medium defining a means for producing, from said two pumping laser beams, a coherent auto-oscillation of two conjugated counter-rotative waves by way of a four wave mixture without electrical excitation of said medium;

interference means for causing interference of said two counter-rotative waves; and

means for detecting a beat produced by said interference of said two counter-rotative waves.

5,004,342

MEASURING DEVICE HAVING A LASER AND A RING RESONATOR

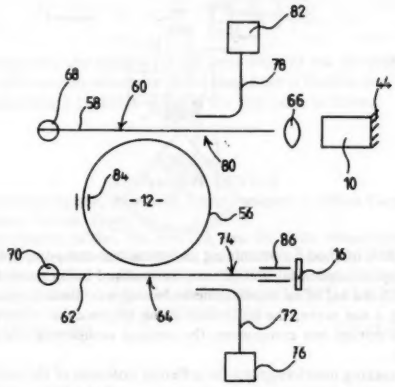
Walter Bernard, Meersburg; Joachim G. Heppner, Tamm, and Karl H. Schwarz, Owingen, all of Fed. Rep. of Germany, assignors to Bodenseewerk Geratetechnik GmbH, Uberlingen, Fed. Rep. of Germany

Filed Apr. 13, 1988, Ser. No. 181,214

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1987, 3712815

Int. Cl.[5] G01B 9/02; G01C 19/64

U.S. Cl. 356—350 23 Claims



1. A measuring device with a laser and a ring resonator for measuring a quantity by which the optical path lengths of the ring resonator for two light waves propagating in opposite directions in the ring resonator are changed in opposite directions, comprising

(a) a passive ring resonator defining a first direction of propagation of light and a second, opposite direction of propagation of light,

(b) a laser arranged outside the ring resonator and means for optically coupling said laser with said ring resonator to provide a first light wave propagating in said ring resonator in said first direction of propagation of light and a second light wave propagating in said ring resonator in said second direction of propagation of light,

(c) said coupling means coupling said laser with said ring resonator in optically unisolated manner, whereby the ring resonator is part of a resonator cavity of the laser,

(d) first detector means for providing a first signal indicative of the intensity of said light wave propagating in said ring resonator in said first direction of propagation of light, and providing a first output signal.

(e) second detector means for providing a second signal indicative of the intensity of said light wave propagating in said ring resonator in said second direction of propagation of light, and providing a second output signal,

(f) modulator means controlled by said first signal for influencing said ring resonator, when said laser and ring resonator system deviates from resonance due to said quantity to be measured, to match the frequency of the laser with the optical path length for the light wave propagating in said first direction of propagation of light, and

(g) output means for providing from said second output signal a signal indicative of said quantity.

5,004,343

MULTIPLE RING PATHS IN ONE BLOCK

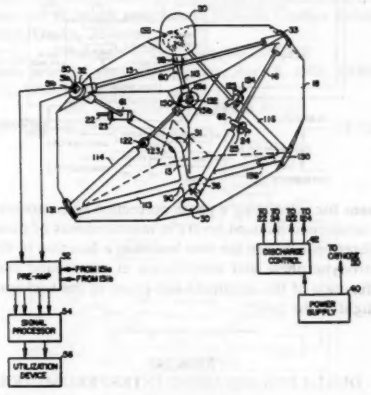
Terry A. Dorschner, Newton Centre, and Irl W. Smith, Newton, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 912,133, Mar. 14, 1986, abandoned, which is a continuation of Ser. No. 412,402, Aug. 27, 1982, abandoned. This application Oct. 27, 1988, Ser. No. 263,965

The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.

Int. Cl.[5] G01C 19/64; H01S 3/101

U.S. Cl. 356—350 26 Claims



1. In combination:

a single supporting block;

means, disposed on said block, for providing a plurality of nonplanar ring resonators within said block, such nonplanar ring resonators comprising equiangular skew rhombus rings having equal length path segments, all of the path segments of said plurality of ring resonators being substantially distinct;

means for producing a beam of electromagnetic energy in each one of the plurality of nonplanar ring resonators; and

wherein the paths of each one of the plurality of nonplanar ring resonators are arranged to provide circular birefringence to the beam of electromagnetic energy produced in such resonator.

5,004,344

APPARATUS AND METHOD FOR CORRECTING RING LASER GYROSCOPE PHASE ERRORS AT TURNAROUND

Daniel A. Tazartes, West Hills; John G. Mark, Pasadena, and Anthony Mathews, Calabassas, all of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Continuation-in-part of Ser. No. 189,047, May 2, 1988, Pat. No. 4,875,774. This application Sep. 11, 1989, Ser. No. 405,515

The portion of the term of this patent subsequent to Oct. 24, 2006, has been disclaimed.

Int. Cl.[5] G01B 9/02

U.S. Cl. 356—350 22 Claims

1. A system for compensating for turnaround phase errors in measurements of rotations with a dithered ring laser gyroscope that includes a frame having a cavity therein for guiding a pair of counterpropagating light beams and means for producing a pair of heterodyne signals that are processed to determine an angle of rotation, comprising:

means for determining the direction of rotation of the frame;

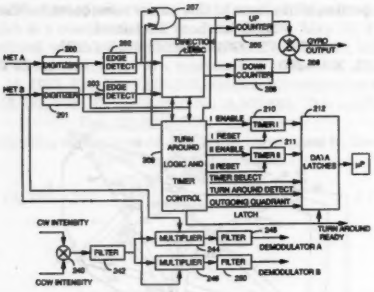
means for detecting turnarounds in direction of rotation of the frame;

means for determining the heterodyne phase at turnaround;

means for determining the heterodyne phase acceleration at turnaround;

means for determining the amplitude of backscattered light in the cavity;

means for determining the phase of backscattered light in the cavity; and



means for calculating a phase correction to compensate for turnaround-induced errors in measurements of phase differences between the two beams as a function of the heterodyne phase and acceleration at turnaround and as a function of the amplitude and phase of the backscattered light in the cavity.

5,004,345

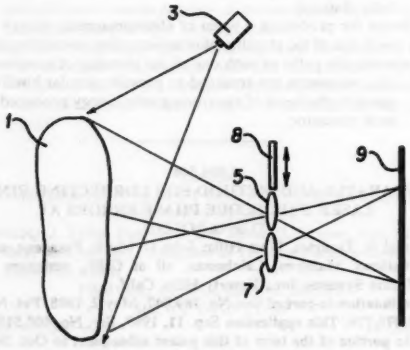
DUAL-LENS SHEARING INTERFEROMETER

Yau Y. Hung, 625 Cambridge Dr., Rochester, Mich. 48063

Filed Dec. 5, 1988, Ser. No. 279,820

Int. Cl.[5] G01B *9/02*

U.S. Cl. 356—353 **7 Claims**



1. A method of analyzing a test object, comprising the steps of:

(a) directing a beam of at least partially coherent light onto the object, to obtain a reflected beam,

(b) passing the reflected beam simultaneously through a pair of optical elements, the optical elements being spaced apart from each other and having distinct optical axes, so that the optical elements produce a pair of laterally-displaced images of the object on a detecting means, the detecting means being singly exposed such that said images therefore with each other to form a single interference pattern,

(c) deforming the object, and repeating steps (a) and (b) while the object is deformed, and

(d) comparing the interference patterns formed during the two iterations of step (b).

5,004,346

METHOD OF EXAMINING AN OPTICAL COMPONENT

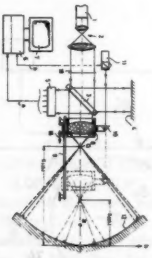
Michael Kühel, Oberkochen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Oct. 26, 1989, Ser. No. 426,772

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1988, 3836564

Int. Cl.[5] G01B *9/02*

U.S. Cl. 356—360 **15 Claims**



1. A method for examining an optical test component which supplies aspherical wavefronts, the method being carried out with the aid of an interferometer having a collimator generating a test wave, the collimator being displaceable relative to the optical test component, the method comprising the steps of:

making interferograms for different positions of the collimator at which component regions of the test wave are adapted to the test component;

measuring the relative position between the collimator and the test component with high precision for said different positions;

electronically registering the interferograms by means of an image sensor and storing said interferograms as light path length differences $L_{act}(h)$ between the test beam and the comparison beam of the interferometer for the individual image points of each interferogram;

computing desired light path length differences $L_{des}(h)$ for the different positions of the collimator;

comparing the interferometrically measured light path length differences $L_{act}(h)$ to said desired light path length differences $L_{des}(h)$ with the phase errors $\Delta\phi(h)$ being formed for the individual image points; and,

computing the errors of the aspheric form of the wavefront of the test component as a whole from the comparisons and the phase errors.

5,004,347

METHOD AND AN APPARATUS FOR INSPECTING THE EDGE OF A LID

Nicholaas C. Swart, Deventer, Netherlands, assignor to Heuft-Qualiplus B.V., Deventer, Netherlands

Filed Nov. 20, 1989, Ser. No. 439,591

Claims priority, application Netherlands, Nov. 21, 1988, 8802869

Int. Cl.[5] G01N *21/88*

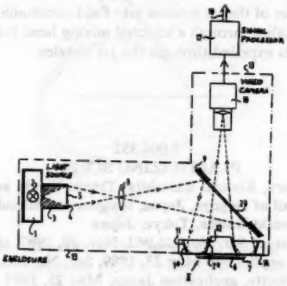
U.S. Cl. 356—394 **13 Claims**

1. A method for inspecting the bent edge of a lid comprising the steps of:

placing the lid in a path of light;

directing the light toward the bent edge of the lid, such that the bent edge casts a shadow onto the lid;

monitoring the shadow of the bent edge of the lid;



comparing the shadow of the bent edge of the lid with a reference to determine if the bent edge is flawed; and

generating a rejection signal if the bent edge is flawed.

5,004,348
ALIGNMENT DEVICE

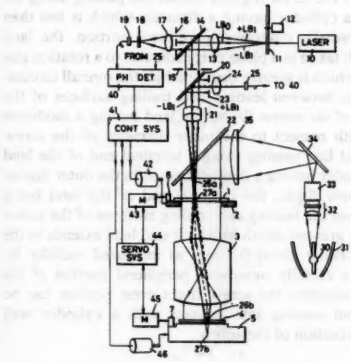
Nobutaka Magome, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 469,713, Jan. 24, 1990, abandoned, which is a continuation of Ser. No. 192,784, May 10, 1988, abandoned. This application Jun. 12, 1990, Ser. No. 536,939

Claims priority, application Japan, May 15, 1987, 62-118500

Int. Cl.[5] G01B *11/26*

U.S. Cl. 356—401 **16 Claims**



1. An alignment device for relatively aligning a mask and a substrate by arranging said mask and said substrate in substantially conjugate relation with respect to light of a first wavelength through an imaging optical system and detecting diffracted lights from a first alignment diffraction grating formed on said mask and a second alignment diffraction grating formed on said substrate, comprising:

an illumination light source for irradiating light of a second wavelength essentially different from said first wavelength to said first diffraction grating and said second diffraction grating;

a detection optical system provided between said illumination light source and said mask;

said detection optical system having an aberration along an optical axis corrected in accordance with a chromatic aberration of said imaging optical system caused by the light of said second wavelength; and

an orientation control means for controlling the orientation of the light of said second wavelength such that said first diffraction grating and said second diffraction grating are illuminated from different directions when the light of said second wavelength is directed through said detection optical system.

5,004,349
LIGHTING APPARATUS AND COLOR MEASURING APPARATUS USING THE SAME

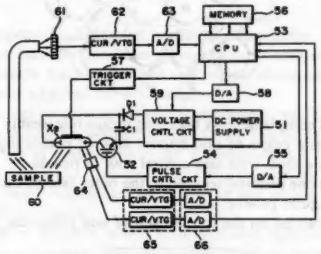
Tsuyoshi Sato, Oita; Masahito Inaba, and Naoya Takata, both of Osaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 4, 1989, Ser. No. 333,318

Claims priority, application Japan, Apr. 5, 1988, 63-86173; Aug. 22, 1988, 63-207816

Int. Cl.[5] G01J *3/46*; H05B *37/02*

U.S. Cl. 356—402 **14 Claims**



1. Color measuring apparatus for measuring color of a sample comprising:

a light source positioned so as to illuminate the sample;

means for detecting color temperature of light coming from the light source without passing through the sample and without being reflected by the sample;

means for storing a relationship between a plurality of color temperatures and a plurality of emission time periods of the light source;

means for comparing the color temperature detected by the detecting means with a predetermined color temperature and for providing a comparison result representative thereof;

means for determining a certain time period on the basis of both the relationship stored in the storing means and the comparison result of the comparing means;

means for energizing the light source during the time period determined by the determining means;

means for detecting light from the sample illuminated by the light source; and

means for measuring a color of the sample in accordance with the light detected by the detecting means.

5,004,350
ROLLER FOR FORMING A DOUGH BALL INTO A PIZZA SHELL

Eugene L. DeChristopher, 20 Ahlstrom Rd., Cotati, Calif. 94928

Filed Jul. 12, 1990, Ser. No. 551,316

Int. Cl.[5] B29B *1/06*

U.S. Cl. 366—69 **6 Claims**

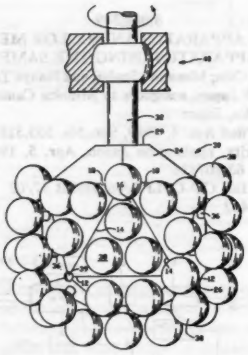
1. A roller for kneading and shaping a dough ball into a pizza shell comprising:

a polyhedron core formed from a flat blank of a semirigid sheet material;

said core having a central, circumferential row of alternately upright and inverted isosceles triangular panels joined by score lines; and

a bottom row of inverted isosceles triangular panels with their bases coinciding with the second bases of the upright isosceles triangular panels of said central row;

first complementary fastening means on the endmost panels of said central row releaseably secured together to form a central ring;



second complementary fastening means releaseably securing the side edges of said bottom row of panels together to form a shell with said central row of panels;

at least one pedestal secured to the outer face of each of said triangular panels;

a ball carried on the top of each of said pedestals.

5,004,351

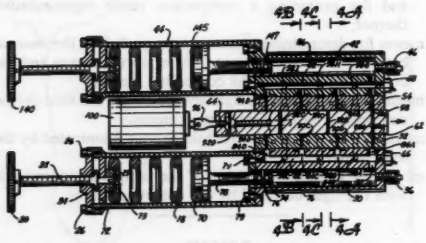
REACTION INJECTION MOLDING MACHINE

Timothy A. Salaba, Burnsville, and Debra L. Wilfong, Lake Elmo, both of Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Apr. 18, 1988, Ser. No. 182,910

Int. Cl.[5] B01F *15/04*

U.S. Cl. 366—152 **16 Claims**



1. An apparatus for metering and mixing at least two fluid reagents and collecting a resultant product in at least a first collection vessel, the apparatus comprising:

a plurality of reservoirs, each reservoir being adapted to contain a selected fluid reagent;

means coupled to each reservoir for pressurizing the reagent contained therein to a desired pressure;

a plurality of jet nozzles in fluid communication with each reservoir for developing streams of reagent expelled from the reservoirs;

a valving rod including a plurality of mixing heads for opening selected sets of jet nozzles to one another for mixing, the mixing heads directing streams of reagents into impinging contact and for further directing the resultant product to a selected collection vessel; and

means for positioning the valving rod against each of the plurality of jet nozzles in closure positions for closing all of the jet nozzles and in opening positions to bring at least a first set of the jet nozzles into fluid communication with one another through a selected mixing head for mixing of reagents expelled through the jet nozzles.

5,004,352

PLASTICIZING SCREW

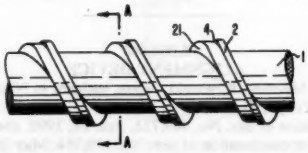
Yukio Tamura; Kiyoshi Kinoshita; Tetsuo Uwaji, and Takashi Mizuno, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 126,962, Nov. 30, 1987, abandoned. This application May 23, 1989, Ser. No. 356,604

Claims priority, application Japan, May 25, 1987, 62-127322

Int. Cl.[5] B29B *1/04*; B01F *7/08*

U.S. Cl. 366—343 **34 Claims**



1. A plasticizing screw having means for generating lubricating pressure between a screw flight and a cylinder comprising a land formed in a crest portion of a screw flight of the plasticizing screw, the crest portion having a radially outermost peripheral portion extending continuously along the entire trailing edge of the screw flight, a helical line passing along the land lying in a cylinder having a diameter which is less than that of said radially outermost peripheral portion, the land having a width taken in a plane perpendicular to a rotation axis of the screw which is greater than one-half the overall circumferential width between leading and trailing surfaces of the crest portion of the screw flight, the land having a moderate inclination with respect to the outer diameter of the screw flight, a helical line passing along a terminal end of the land lying in a cylinder having a diameter equal to the outer diameter of the screw flight, the terminal end of the land being located between the leading and trailing surfaces of the screw flight, and the greatest depth to which said land extends in the crest portion being about 0.5 mm as measured radially inwardly from a radially outermost peripheral portion of the screw flight whereby the screw flight crest portion can be prevented from coming into contact with a cylinder wall surface upon rotation of the screw.

5,004,353

FLUID MIXING ACCESSORY

Jeffrey J. Martin, 1016 North Cavalier, Moore, Okla. 73160

Filed Nov. 15, 1989, Ser. No. 438,614

Int. Cl.[5] B01F *15/00*

U.S. Cl. 366—349 **21 Claims**

1. A fluid mixing accessory comprising:

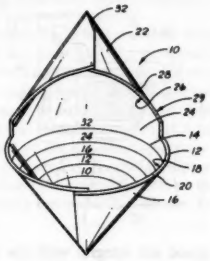
a funnel having a mouth and a bottom;

a mixing receptacle having a mouth and a bottom;

a connecting portion between the mouth of the funnel and the mouth of the mixing receptacle; and

wherein the funnel, the mixing receptacle and connecting portion are relatively disposed so that fluid contained in

the mixing receptacle can be transferred across the connecting portion to the funnel; and



wherein the diameter of the funnel and mixing receptacle gradually diminishes from the mouth to the bottom.

5,004,354

HEAT TRANSFER MEASUREMENT

Donald B. Utton, Altrincham, and Stephen R. Windebank, Brooklands, both of England, assignors to NNC Limited, England

Filed Aug. 3, 1989, Ser. No. 389,128

Claims priority, application United Kingdom, Aug. 16, 1988, 8819442

Int. Cl.[5] G01K *17/10, 17/02*

U.S. Cl. 374—29 22 Claims

1. A method of measuring a heat transfer coefficient, comprising the steps of: exposing a surface having a temperature to an environment having a different temperature and in which heat transfer takes place between the exposed surface and the environment by at least one of condensation, convection, and radiation mechanisms, the exposed surface having a predetermined area; transporting heat transferred to the exposed surface to a location external to said environment by passage of a working fluid having a heat content along a heat pipe; measuring the heat content of the working fluid at said external location; determining a temperature difference between the temperature of the exposed surface and the temperature of the environment; and determining the heat transfer coefficient from said heat content, said temperature difference and said predetermined area.

5,004,355

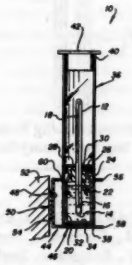
TEMPERATURE MEASURING APPARATUS

Wayne L. Ryan, Omaha, Nebr., assignor to Streck Laboratories, Inc., Omaha, Nebr.

Filed Oct. 4, 1989, Ser. No. 417,045

Int. Cl.[5] G01K *5/002*

U.S. Cl. 374—194 9 Claims



6. A temperature measuring apparatus comprising:

a tubular bulb thermometer having a bulb containing an expandable fluid at one end and indicia along said thermometer adjacent the other end;

a cylindrical receptacle for said thermometer, said receptacle including an isothermal liquid bath therein in which said bulb of said thermometer is immersed and directly contacting and a seal means in a top thereof for sealing about said thermometer while leaving said indicia outside of said receptacle;

a cylindrical member which surrounds said receptacle and said thermometer, said cylindrical member including a transparent portion adjacent said indicia of said thermometer, a bottom against which said receptacle rests, and a removable liquid-tight cap;

a holder means for holding said cylindrical member adjacent a vertical wall of an environment to be measured, said holder means including (a) a U-shaped bracket having a center part which is mounted to the wall such that an upper leg of said U-shaped bracket extends horizontally from the wall and above a lower leg of said U-shaped bracket, said upper leg including an aperture therein which is spaced from said center part and through which said cylindrical member extends with said bottom of said cylindrical member resting on said lower leg, and (b) a mounting means attached to said center part for removably mounting said bracket to the wall.

5,004,356

FASTENER AND WRAPPING BAG HAVING THE SAME

Kazufumi Matsui, Himeji, Japan, assignor to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1989, Ser. No. 443,000

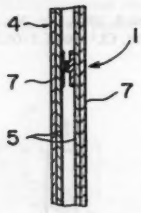
Claims priority, application Japan, Nov. 29, 1988, 63-303391

Int. Cl.[5] B65D *33/24*

U.S. Cl. 383—63 14 Claims

6. A wrapping bag having a bag body, and a fastener comprising a pair of fastener elements which are engagable with each other and which have respective portions thereof welded to said bag body, at least said portions of said fastener elements

which are welded to said bag body being mainly made of ethylene vinyl acetate copolymer resin containing 1 to 9% vinyl acetate by weight and having a melt index of 0.5 to 6.0 g/10 minutes, and said bag body being formed into a bag shape.



5,004,357

BEARING PART FOR A GAS BEARING

Hooykaas, Carel W. J., Rotterdam, Netherlands, assignor to Pelt & Hooykas B.V., Rotterdam, Netherlands

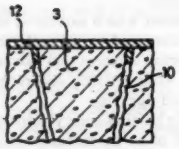
Continuation of Ser. No. 189,237, May 2, 1988, abandoned, which is a division of Ser. No. 908,370, Sep. 19, 1986, Pat. No. 4,741,629. This application Aug. 10, 1989, Ser. No. 393,090

Claims priority, application Netherlands, Sep. 27, 1985, 8502650

The portion of the term of this patent subsequent to May 3, 2006, has been disclaimed.

Int. Cl.[5] F16C *32/06*

U.S. Cl. 384—121 5 Claims



1. A gas bearing part (2) for a gas bearing (1) for supporting another bearing part (3) said bearing parts being movable with respect to each other, when a gas gap is maintained between the bearing part (2) and said another bearing part (3), wherein said bearing part (2) is non-sintered and comprises a granite-like substance or a metal having gas leakage channels (10) in the surface of its working face, which gas leakage channels (10) are sealed by a film of a non-brittle lubricant-free gas leakage channels sealing polymer (9, 12).

5,004,358

DEVICE ENABLING THE REVOLUTIONARY SPEED TO BE MEASURED BETWEEN TWO PARTS IN RELATIVE ROTATION SUCH AS THE SUPPORTS OF A VEHICLE WHEEL

Angelo Varvello; Angelo Vignotto, and Roberto Moretti, all of Turin, Italy, assignors to RIV-SKF Officine di Villar Perosa S.p.A., Turin, Italy

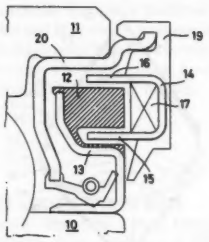
Filed Apr. 9, 1990, Ser. No. 506,112

Claims priority, application Italy, Dec. 15, 1989, 68093 A/89

Int. Cl.[5] F16C *19/00*

U.S. Cl. 384—446 7 Claims

1. Device enabling the speed to be measured between two parts in relative rotation such as the supports of a vehicle wheel and in particular between rings of a rolling bearing for the support of a vehicle wheel, characterized by the fact that first shield integral with a rotating ring of the bearing carries a magnetized ring with pairs of alternate poles, which is placed in front of, in operation, a passive sensor borne by a second shield attached to the fixed ring of the bearing; the sensor being inductive with n pole pieces in a number proportional to the pairs of alternate poles of the magnetized ring; the configurations of shields and sensor being such that the elements measuring the relative speed are integral with the shields and protected outwards.



5,004,359

ROLLER BEARING

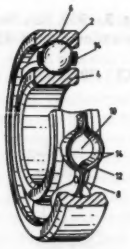
Bo O. Jacobson, Zeist, Netherlands, assignor to SKF Industrial Trading and Development Co. B.V., Nieuwegein, Netherlands

Continuation of Ser. No. 355,972, May 23, 1989, abandoned. This application Jul. 27, 1990, Ser. No. 560,283

Claims priority, application Netherlands, May 31, 1988, 8801389

Int. Cl.[5] F16C *33/44*

U.S. Cl. 384—526 6 Claims



1. Roller bearing equipped with rollers held between an inner and an outer race of the bearing and kept separate from one another by a bearing cage which is formed by an annular component consisting of one or more parts in which, along the circumference and at equal distances from one another, partially or fully enclosed openings have been formed in which each contain a rolling bearing, characterized in that the walls of the openings are coated entirely or partially with a rubber coating and that the size of the rubber-coated openings is smaller than the size of the rollers to such a degree that the rubber coating around the mounted rollers is elastically deformed.

5,004,360

CARRIAGE DEVICE FOR AN ELECTRONIC TYPEWERITER USING A TWO-ROW DAISY WHEEL

Chang S. Ahn, Kyungki, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed May 31, 1989, Ser. No. 359,840

Claims priority, application Rep. of Korea, May 31, 1988, 6630/1988

Int. Cl.[5] B41J *1/24*

U.S. Cl. 400—144.2 9 Claims

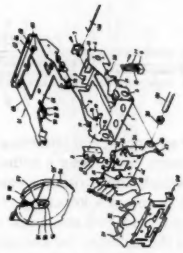
1. A carriage device for an electronic typewriter comprising:

a slant bracket rotatably mounted on a forward end of a main frame around a rail for pushing and rotating a knob;

a toggle spring having one end connected to one side wall plate of said main frame and the other end thereof connected to one side wall plate of said slant bracket, said toggle spring resiliently supporting the slant bracket in forward and rearward position;

an eccentric stopper and a stop member mounted on the side wall plate of the main frame, respectively, for restricting the forward and rearward rotation of said slant bracket;

a print wheel loading means including a pair of supporting members formed at both lower ends of said slant bracket and structured in a manner such that when a print wheel case is inserted at the position where the slant bracket is retracted, the upper end thereof is supported by the supporting member of the slant bracket so that a print wheel shaft is smoothly entered into a central hole of a hub of a print wheel;



a hammering means including a solenoid fixed to a hammer guide of the slant bracket so that an operational rod hits a hammer lever, whereby a spoke of the print wheel is hit by the hammer lever so as to be typed;

a print wheel elevation and rotation member for moving upward and downward and rotating the print wheel to a typing position;

a print ribbon carrying member for carrying a print ribbon;

a correction tape up/down and carrying member for moving upward and downward and carrying a correction tape;

a first drive motor for driving the print ribbon carrying member and correction tape up/down and carrying member; and

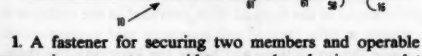
a sensing means interconnected with a cam gear for detecting the carrying condition of the correction tape and print ribbon by sensing the rotation of the cam gear.

5,004,361

FASTENER FOR USE AT CRYOGENIC TEMPERATURES, AND TOOL THEREFOR

Philip D. Winnie, N. Huntingdon, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 7, 1989, Ser. No. 404,137
Int. Cl.[5] F16B *35/00, 23/00*
U.S. Cl. 411—366 **16 Claims**



1. A fastener for securing two members and operable at cryogenic temperatures, said two members having a predetermined combined thickness with axially aligned holes therethrough for receiving said fastener which comprises:

a generally cylindrical nut having a neck portion with an internally threaded bore therethrough, and a first substantially flat head portion axially adjacent one end of the neck portion;

a generally cylindrical bolt having an externally threaded body portion adapted to engage the internally threaded bore of the nut, and a second substantially flat head portion axially adjacent one end of the body portion, the nut and bolt cooperating in such a manner that said respective head portions are disposed at opposite ends of an assembled fastener; and

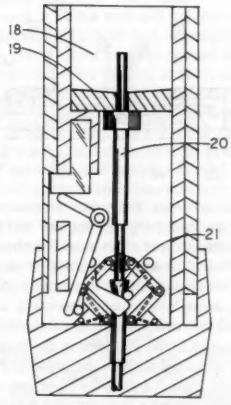
wherein each of said head portions of said nut and bolt have outer circumferential surfaces which are inwardly tapered toward said neck and body portions, respectively, and said holes of said two members each have a corresponding and oppositely tapered portion adjacent one surface for respectively receiving said tapered head portions of said nut and bolt, the length of a fully assembled fastener being not greater than the combined thickness of said two members, and the fastener being made of a material having a predetermined coefficient of thermal expansion such that said assembled fastener maintains a predetermined contact pressure between said two members and said flat head portions of said nut and bolt remain flush with said respective surfaces of each of said two members as said two fastened members are cooled to cryogenic temperatures whereby frictional heating of said two members is prevented.

5,004,362

MECHANICAL PENCIL

Leon Robert Palmer, 81 Pennsylvania Ave., Somerset, Mass. 02726

Filed May 29, 1990, Ser. No. 529,584
Int. Cl.[5] B43K *21/22*
U.S. Cl. 401—53 **7 Claims**



1. A mechanical pencil provided with a lead-advancing device comprising of a plurality of separate and equally opposing spring clip mechanisms pivotally fastened for extendability and bearing against the lead with pivotally attached lead grippers for advancing and retaining said lead in place firmly during the writing process; one of said spring clip mechanisms serving as a leader and provided with a mechanical means to cause the remaining mechanisms to serve as its follower and perform a mirror-image of its motions as the said leader and follower spring clip mechanisms are caused simultaneously to pivotally lift away from bearing on exactly opposite sides of lead, pivotally move to their extended-most position for re-grasping the lead at the higher position and advance the lead as the spring-loaded set of mechanisms contract to their rest position; the extension motion of the leader and follower

spring clip mechanisms being caused by a pivotally fastened driver-lever whose shorter arm is forced downward by sliding contact against the bottom flat surface of a slider which serves as an extension of the bearing surface in the recessed section in the inside wall of the external longitudinally slidable sleeve; the longer arm of said driver-lever bearing with sliding contact on the cylindrical projection of the tail section of the leader spring clip for causing the lead advancing mechanisms to simultaneously lift away from the lead, extend and regrasp the lead then contract and thereby advance the lead to a suitable writing length beyond the pencil tip with a single pressing of the writing tip against a writing surface without interrupting of the writing process and thereby eliminating the need for the writing hand to change position in order to reach to and depress the opposite end of pencil to advance the lead.

5,004,363

APPLICATOR DEVICE FOR COSMETIC USES

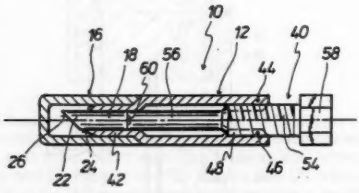
Gerhard Hüttner, Geroldsgrün; Peter Krückel, Heroldsberg, and Gerhard Möck, Kirchehrenbach, all of Fed. Rep. of Germany, assignors to Schwan-Stabilo Schwanhausser GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Mar. 12, 1990, Ser. No. 491,861

Claims priority, application Fed. Rep. of Germany, May 23, 1989, 3916670

Int. Cl.[5] A45D *40/04*

U.S. Cl. 401—75 5 Claims



1. An applicator device for cosmetic uses comprising: an elongate plastic casing having a front end and a rear end and including a tubular element of an axial lengthwise extent substantially of between 20 and 60 mm and an outside diameter substantially of between 3 and 8 mm; a pasty stick of cosmetic material, of an axial lengthwise dimension substantially of between 5 and 20 mm and a diameter substantially of between 2 and 5 mm, the stick being disposed in the tubular element of the casing at the front end thereof and providing an application portion adapted to project out of the front end of the casing; a plastic feed spindle having a forward end which bears against the end of the stick which is inward of the casing and a rearward larger diameter end which projects out of the casing, the spindle comprising an external screwthread means at a spacing from said forward end of said spindle towards said rearward end thereof; means guiding the spindle in the front end portion of the casing; the casing in a rear end portion therof internally comprising an integrally formed holding portion having a threaded portion engaged with said external screwthreaded means on said spindle; an actuating member on the rearward end portion of the spindle which projects out of said tubular element; and a closure cap adapted to fit on to the front end of the casing wherein the spindle with its external screwthread means comprises a harder plastic material than the tubular element with its holding portion.

5,004,364

DEVICE FOR ADVANCING AND RETRACTING WRITING ELEMENT IN WRITING INSTRUMENT

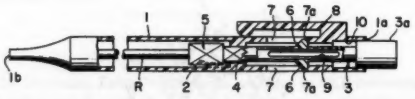
Yoshihiro Tomura, Oomiya; Keiji Maruhashi, Isesaki, and Nobuyuki Ozawa, Oota, all of Japan, assignors to Kabushiki Kaisha Pilot, Tokyo, Japan

Filed Apr. 17, 1990, Ser. No. 510,080

Claims priority, application Japan, Jul. 7, 1989, 1-79599

Int. Cl.[5] B43K *24/08*

U.S. Cl. 401—110 4 Claims



1. In a device for advancing and retracting a writing element in a writing instrument, comprising a cylinder having a front opening through which the writing element advances and retracts and a rear opening, a knocking rod disposed in the cylinder and having a front end and a rear end exposed from the rear opening of the cylinder for knocking operation, said front end being formed as a cam portion, stationary cam means provided on an inner surface of the cylinder and having front sloping cam surfaces and guide grooves, said front sloping cam surfaces and guide grooves being arranged alternately in the circumferential direction of said inner surface of the cylinder in such a manner that the guide grooves extend from the cam surfaces axially of the cylinder toward said rear opening, and a rotary cam follower provided in the cylinder and engaging said guide grooves for guided movement axially of the cylinder, said writing element being resiliently urged rearwardly of the cylinder against said cam follower, said rotary cam follower being disposed in front of said knocking rod so as to be acted upon by said cam portion when the knocking rod is pushed, said cam portion being shaped to impart a rotary force to the rotary cam follower while acting on the cam follower whereby when the knocking rod is pushed, until the cam follower is disengaged from the guide grooves, and is then released, the rotary cam follower is rotated to abut on said front sloping cam surfaces, thereby to maintain the writing element in an advanced position, and whereby when the knocking rod is pushed and released next time, the rotary cam follower is moved off the front sloping cam surfaces and is then engaged under rotary force into the guide grooves to be moved rearward along the grooves to allow the writing element to move back to a retracted position:

the improvement comprising:

engaging projections integrally formed on the outer surface of the knocking rod so as to project radially outwardly of the rod, said projections being arranged in circumferentially spaced apart disposition, said rod having slots extending axially thereof between adjoining engaging projections thereby to make the engaging projections resiliently displaceable radially inward upon being forced radially inward; and

guide means in the form of slots provided in the cylinder to extend axially thereof and engaging said projections to guide the projections and hence the knocking rod therealong, said guide means having at a rear end thereof stop means for abutting said projections to prevent the knocking rod from slipping out of the rear opening of the cylinder.

5,004,365

DROP-WEIGHT AND TUBULAR WRITING INSTRUMENT

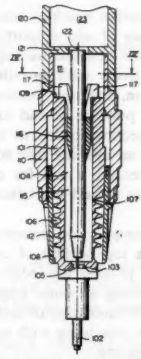
Peter Felgentreu, Hamburg, Fed. Rep. of Germany, assignor to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Division of Ser. No. 347,215, May 4, 1989. This application May 4, 1990, Ser. No. 519,499

Claims priority, application Fed. Rep. of Germany, May 7, 1988, 3815712; Oct. 15, 1988, 3835146

Int. Cl.[5] B43K *8/00, 15/00*

U.S. Cl. 401—258 14 Claims



1. A tubular writing instrument having a drop weight body (115) located in an inner bore chamber (104, 111) of a housing (101, 110) which is connected with a writing fluid supply chamber (123) and which has in its front end a cleaning wire (116) extending into the writing tube (102) and having a drop weight retainer (121) to limit the displacement of the drop weight body (115) in the direction towards the writing fluid supply chamber (123), characterized in that a bush element (116) is fixed upon the drop weight body (115) and clampingly held at least during assembly, said bush element further having a radially outward extending shoulder area (117) provided between the drop weight retainer (121) and an abutment area (109) of the housing (101, 110) that is located between the bush element and the writing tube (102).

5,004,366

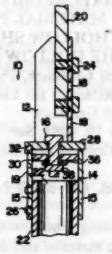
BREAK-AWAY COUPLING

George H. Simmons, 814 Weekslanding Rd., Cape May, N.J. 08204

Filed Nov. 2, 1989, Ser. No. 430,827

Int. Cl.[5] F16D *9/00*

U.S. Cl. 403—2 26 Claims



1. A break-away coupling for mounting an elongated member, comprising:

two opposingly fixed engagement members connectable to one another end-to-end, a first engagement member being a lower member attachable relative to the ground and a second engagement member being an upper member attachable to said elongated member;

said engagement members having facing flange plates, each flange plate having an opening aligned with an opening of the other said flange plate;

a shear bolt projecting through said openings in said flange plates and fixing said flange plates together; and,

an anti-pivot pin engaging between the opposingly fixed engagement members across a plane of abutment thereof, each of the engagement members having a contour defining a portion of a pin receptacle for receiving the anti-pivot pin at a point spaced radially from an axis defined by the shear bolt,

whereby when said elongated member is struck with force, said shear bolt breaks and said engagement members disconnect without damage.

5,004,367

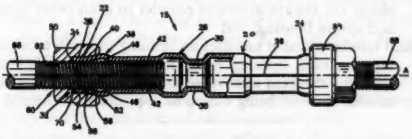
TURNBUCKLE ASSEMBLY

Ruey E. Wood, Jr., Mount Clemens, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed Dec. 1, 1989, Ser. No. 444,563

Int. Cl.[5] F16B *7/06*

U.S. Cl. 403—46 13 Claims



1. A turnbuckle assembly comprising:

a sleeve having a sleeve axis and an end portion, said end portion including an open end, an outer spacing surface, and an inclined outer surface spaced axially from said open end by said outer spacing surface, said inclined outer surface extending radially outwardly with respect to said sleeve axis in an axial direction away from said open end; and

a nut having a nut axis, nut threads, an open end receivable coaxially onto said end portion of said sleeve, an inner spacing surface receivable over said outer spacing surface of said sleeve, and an inclined inner surface spaced axially from said nut threads by said inner spacing surface, said inclined inner surface extending radially with respect to said nut axis to operatively register in surface contact with said inclined outer surface of said sleeve.

5,004,368

PIVOT ARM FOR APPARATUS, PARTICULARLY MEDICAL APPARATUS

Ewald Warga, Hegel-Str. 6, D-7130 Mühlacker 3, Fed. Rep. of Germany

Filed Mar. 16, 1989, Ser. No. 324,005

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1988, 3809266

Int. Cl.[5] F16B *7/10*

U.S. Cl. 403—166 21 Claims

1. A pivot arm, one end of which is to be mounted on a stationary support or other such carrier or attachment of an apparatus, particularly a medical apparatus to be pivoted up and down as well as in a plane, comprising:

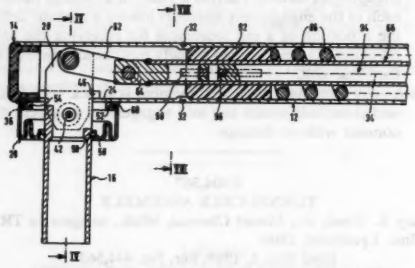
first and second mounting supports that are always parallel to one another and are connected with each other by at least one cross-member that is hinged to both supports by means of parallel pivot axles;

said cross-member forming a spring housing in which a

helical compression spring is indirectly supported against the spring housing and a connecting rod that holds a spring support which is fixed relative to the rod adjacent said second mounting support, said spring and connecting rod being coaxially arranged within said spring housing, wherein;

said connecting rod is hinged to said first mounting support by means of at least a first coupling wherein:

said cross-member forming said spring housing comprises a



single, hollow, primarily tubular member that is essentially closed on all sides and housing a second coupling between the rod end nearest the spring support and the adjacent second mounting support, whereby both couplings are always arranged parallel to each other within said spring housing; and

said tubular member includes an opening for each mounting support, each opening being located along one of said sides and directed transverse to said connecting rod, said tubular member being closed at opposite ends thereof.

5,004,369

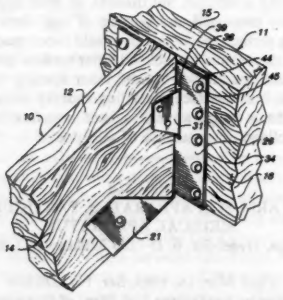
SLOPE AND SKEW HANGER

Daniel E. Young, Owatonna, Minn., assignor to United Steel Products Co., Montgomery, Minn.

Filed Jun. 23, 1989, Ser. No. 370,689

Int. Cl.[5] F16B *7/08*

U.S. Cl. 403—232.1 **10 Claims**



1. A slope and skew hanger for mounting a supported wooden member relative to a supporting wooden member in which said supported member includes top and bottom edges, a pair of spaced parallel sides joining said top and bottom edges and an end and in which said supporting member includes a front face, said hanger comprising:

a seat portion including

a seat member adapted for engagement with the bottom edges of said supported member, said seat member having a seat end and a pair of parallel seat edges extending from said first end and

a pair of seat sides integrally connected with said seat member and extending upwardly from said seat member along said pair of seat edges at substantially right angles to said seat member, each of said seat sides including a nail opening to receive a nail for connecting said seat sides to said sides of said supported member; and

a connection portion adapted for connection to a portion of said supported member and the front face of said supporting member and being integrally joined with said seat portion along a first bend line defined by said seat end, said connection portion having top and bottom outer edges, a pair of outer side edges and a closed integral opening having continuous top and bottom opening edges and a pair of opening side edges, said connection portion further including

a pair of side connection brackets adapted for connection with said front face of said supporting member, each of said side connection brackets having an outer side edge coinciding respectively with an outer side edge of said connection portion, top and bottom edges coinciding respectively with portions of said top and bottom outer edges of said connection portion, an inner edge coinciding respectively with an opening side edge and at least one nail opening to receive a nail for connecting said side connecting bracket to said front face of said supporting member,

a single piece, continuous top connection strip integrally connected with a top portion of each side connection bracket adjacent to said top edge of said connection bracket and including an outer edge coinciding with a portion of said top outer edge of said connection portion and an inner edge coinciding with said top opening edge of said internal opening,

a bottom connection strip integrally connected with a bottom portion of each side connection bracket adjacent to said bottom edge of said connection bracket and including an outer edge coinciding with said first bend line and an inner edge coinciding with said bottom opening edge of said internal opening, and

a pair of connection flanges adapted for connection to opposite sides of said supported member, each of said flanges being integrally connected with and extending outwardly from a corresponding one of said side connection brackets along a second bend line, each of said second bend lines defined by a portion of said inner edge of said corresponding one of said side connection brackets, each of said flanges further including at least one nail opening to receive a nail for connecting said flange to one of said sides of said supported member, each of said side connection brackets further being bendable relative to said top and bottom connection strips along respective third bend lines defined by said inner edge of each of said side connection brackets.

5,004,370

HOLLOW SHAFT HAVING DRIVE ELEMENTS WITH AXIALLY VARIED MATERIAL PROPERTIES BEING SECURED ON THE HOLLOW SHAFT BY EXPANSION OF THE HOLLOW SHAFT

Helmut Swars, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Emitec Gesellschaft für Emissionstechnologie mbH, Lohmar, Fed. Rep. of Germany

Filed May 19, 1988, Ser. No. 196,150

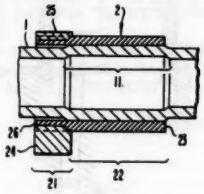
Claims priority, application Fed. Rep. of Germany, May 25, 1987, 3717534

Int. Cl.[5] B25G *3/28*

U.S. Cl. 403—277 **16 Claims**

1. Assembly, comprising a hollow shaft, and drive elements partly formed of brittle material and each including, as viewed in axial succession along said hollow shaft, a first region containing material of relatively low ductility, and a second rotationally symmetrical region containing material of relatively

high ductility and being axially non-symmetrically connected to said first region, said hollow shaft having expanded sections



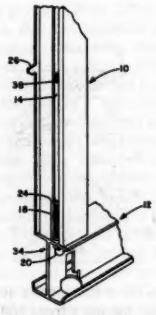
only opposite said second regions securing said drive elements on said hollow shaft.

5,004,371

OFFICE PARTITION, PANEL-TO-PANEL QUICK-LOCKING MECHANISM

Thomas V. Sorensen, Sparks, Nev., assignor to The Gunlocke Co., Avon, N.Y.

Filed Mar. 4, 1988, Ser. No. 164,187
Int. Cl.[5] F16B *9/00*; H47G *5/00*
U.S. Cl. 403—327 **5 Claims**



1. In a panel for use in constructing a partition wall, the improvement, comprising:

a vertical post at one end of the panel;

a tab extending from said post;

a slot within said post, said slot adapted to receive a tab from an adjoining panel;

a locking bar in juxtaposition to said slot and adapted for making securing engagement with said tab from the adjoining panel, said locking bar being biased into said securing engagement;

means connected to said locking bar for urging said locking bar from said securing engagement when manually actuated;

a spring received by said vertical post and engaging said locking bar, said spring biasing said locking bar into said securing engagement, said locking bar being slidably received within a channel in said vertical post; and

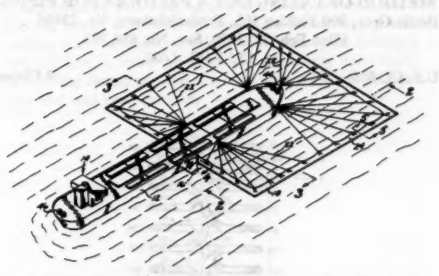
a pull ring secured to one end of said locking bar for allowing manual actuation of said locking bar against biasing of said spring.

5,004,372

SPILL CONTAINMENT SYSTEM

Gerald M. Dickie, 2178 Lomina Ave.; Steve L. Liles, 1925 Pattiz Ave., both of Long Beach, Calif. 90815, and Alan H. Woldvedt, 17274 Bellder Dr., Downey, Calif. 90242

Filed Jun. 27, 1990, Ser. No. 544,739
Int. Cl.[5] B63B *43/16*
U.S. Cl. 405—63 **7 Claims**



1. A deployable device for containing cargo leaking from a watercraft, comprising:

a sealing boot transversely positionable about the watercraft's hull and of sufficient length to extend from a point above the waterline on one side of the hull, underneath the hull to a point above the waterline on the opposite side of the hull, for sealingly engaging said hull upon deployment;

an impermeable liner, contiguously affixed to said sealing boot and dimensioned so as to be extendable substantially beyond the periphery of said watercraft; and

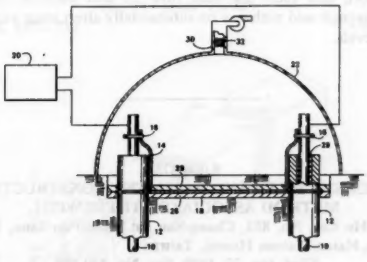
a buoyant boom, contiguously affixed to the periphery of said liner.

5,004,373

METHOD FOR INITIATING IN-SITU VITRIFICATION USING AN IMPREGNATED CORD

John G. Carter, Richland, Wash., assignor to Battelle Memorial Institute, Richland, Wash.

Filed Dec. 8, 1988, Ser. No. 282,120
Int. Cl.[5] E02D *3/11*; G21F *9/16*
U.S. Cl. 405—131 **13 Claims**



1. A method for initiating the in-situ vitrification of soil, comprising the following steps:

impregnating a cord composed of dielectric fibers with a conductive material in finely divided form, whereby the conductive material enters interstices among the fibers of the cord,

positioning the cord so that it is in thermally-conductive contact with the soil and connecting the cord between a pair of electrode that extend into the soil, and energizing

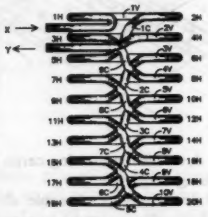
the cord with an electric current for heating the cord and starting the vitrification process.

5,004,374

METHOD OF LAYING OUT A PATHWAY FOR PIPING

Bettie Grey, 900 Ficklen Rd., Fredericksburg, Va. 22405

Filed Feb. 28, 1990, Ser. No. 486,393
Int. Cl.[5] F16L *1/00*
U.S. Cl. 405—154 9 Claims



1. A method of laying out a continuous pathway for piping, said piping for allowing a flow of a medium therethrough, comprising the steps of:

(a) laying out a pathway in a torus shape which spirals vertically and includes a plurality of interconnected vertically descending and ascending levels;

(b) providing a separate length of piping for each of a plurality of horizontal levels;

(c) numbering in sequence, beginning with number 1, a beginning port and an ending port of each separate length of piping on each horizontal level;

(d) numbering in sequence, beginning with number 1, each level of piping for each of said vertically descending and ascending levels;

(e) positioning an inlet port and an outlet port of said continuous pathway proximate each other at adjacent levels; and

(f) flowing a medium through said pathway such that a flow of said medium descends on a plurality of odd-numbered vertical levels and said flow of said medium ascends on a plurality of even-numbered vertical levels up to said outlet port, and such that said flow of said medium moves through said pathway on substantially alternating vertical levels.

5,004,375

BASEMENT PILES AND BASEMENT CONSTRUCTION METHOD ASSOCIATED THEREWITH

Yuan-Ho Lee, No. 851, Chung-San Rd., Nan-Pao Tsun, Kuei-Jen, Hsian, Tainan Hsieng, Taiwan

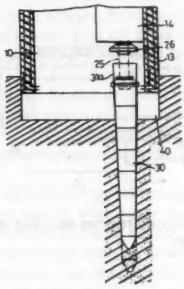
Filed Jun. 22, 1989, Ser. No. 370,254
Int. Cl.[5] F02D *5/00*
U.S. Cl. 405—230 4 Claims

1. A method of constructing a basement of a building on a construction site comprising the steps of:

pre-forming the basement construction of a building on a construction site;

providing a plurality of hydraulic devices to be associated with said pre-formed basement;

providing a plurality of piles, each being driven by one of said hydraulic devices into the construction site one by one; and



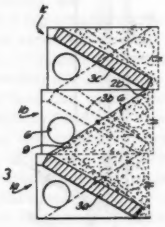
manipulating each of said hydraulic devices simultaneously to sink the pre-formed basement into the construction site.

5,004,376

FACING SYSTEM

Henri Vidal, 8 Bis, Boulevard Maillot, 92200 Neuilly-sur-Seine, France; Santiago Muelas-Medrano, Madrid, Spain, and Pierre Segrestin, St Cyr L'Ecole, France, assignors to Henri Vidal, Neuilly-sur-Seine, France

Filed May 30, 1989, Ser. No. 358,619
Claims priority, application United Kingdom, Jun. 3, 1988, 8813146
Int. Cl.[5] E02D *29/02, 17/00*
U.S. Cl. 405—284 11 Claims



1. A facing system for a frictionally stabilized earth structure, said facing system having a front and a rear and comprising: an assembly of sloping facing panels each of which has a substantially horizontal upper edge and a lower edge situated rearward of said upper edge and substantially parallel thereto; means for supporting said facing panels to form a series of superimposed substantially horizontal tiers thereof, the sloping facing panels in said tiers being laterally spaced to define lateral spaces between adjacent facing panels, and the facing panels in said tiers being positioned vertically above corresponding lateral spaces between facing panels in the tier below, whereby earth immediately behind said facing system in contact with said facing panels forms an open sloping surface from the lower edge of each facing panel through the lateral space in the tier immediately below to the upper edge of the facing panel vertically below said lateral space, the slope of said surface being less than the angle of repose of the earth; earth retaining means provided on each side of each said facing panel for restraining lateral movement of the earth of said slope; and said panels and/or said support means being provided with means for attachment to frictional stabilizing members embedded in the earth of said structure.

5,004,377
ISOLATED INSERTION CHUTE FOR SUCTION-OPERATED GARBAGE DISPOSAL SYSTEMS

Per Naumburg, Borgnyvägen 5, Djursholm, Sweden S-182 65

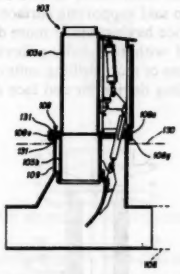
PCT No. PCT/SE88/00404, § 371 Date Feb. 1, 1990, § 102(e) Date Feb. 1, 1990, PCT Pub. No. WO89/01450, PCT Pub. Date Feb. 23, 1989

PCT Filed Aug. 10, 1988, Ser. No. 460,170

Claims priority, application Sweden, Aug. 17, 1987, 8703188

Int. Cl.[5] B65G *53/46*

U.S. Cl. 406—120 22 Claims



1. Isolated insertion chutes (**103**; **203**) of the kind which at spaced intervals are connected to an underground suction conveying conduit communicating with a refuse suction system, the upper end of each chute above ground comprising a closable insertion opening and the lower end of each chute below ground being connected to the suction conveying conduit and being closable by means of a valve means (**116**) provided at said lower end and having valve operating means (**112**), characterized in that the insertion chute (**103**; **203**) consists of an upper chute portion (**103***a*; **203***a*) and a lower chute portion (**103***b*; **203***b*), in that the insertion chute comprises at least one connecting flange (**108***a*, **108***e*; **208***a*) in the transition area between the upper chute portion (**103***a*; **203***a*) and the lower chute portion (**103***b*; **203***b*), in that the lower chute portion (**103***b*; **203***b*) is received in a branching (**109**) extended from the suction conveying conduit (**106**) and at its upper end also having a connecting flange (**108***g*; **208***g*), said at least one connecting flange (**108***a*, **108***e*; **208***a*) of the insertion chute (**103**; **203**) being releasably connected to the connecting flange (**108***g*; **208***g*) of the branching (**109**), in that the branching (**109**) has such a length in relation to the depth cf the suction conveying conduit (**106**) below the ground surface, that the flange joint (**108**; **208**) formed by the connecting flanges (**108***a*, **108***e*, **108***g*; **208***a*, **208***g*) is positioned above the ground surface (**130**), and in that the valve operating means (**112**) is mounted to the insertion chute (**103**; **203**), whereby the insertion chute with valve means (**116**) and valve operating means (**112**) is dismountable from the suction conveying conduit (**106**) from the ground level, for maintenance and repair work.

5,004,378
CLAMPED CUTTING TOOL

Tatsuo Arai, Kitamoto, and Katsumi Haga, Tokyo, both of Japan, assignors to Mitsubishi Metal Corporation, Tokyo, Japan

Filed May 18, 1989, Ser. No. 353,696

Claims priority, application Japan, May 19, 1988, 63-66152[U]; May 31, 1988, 63-72508[U]; Apr. 28, 1989, 1-50352[U]

Int. Cl.[5] B23C *5/22*

U.S. Cl. 407—106 11 Claims

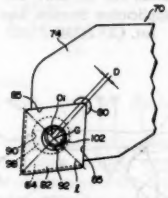
1. A clamped cutting tool comprising:

a tool-holder including a forward end portion having an insert receiving recess formed therein, said recess having a bottom wall and at least two side walls extending upwardly from said bottom wall, said bottom wall including a pin-receiving hole of a circular cross-section formed therein so as to extend downwardly;

a shim member having a bore of a circular cross-section formed therethrough, said shim member being disposed on said bottom wall of said recess in such a manner that said bore communicates with and is concentric to said pin-receiving hole of said tool-holder;

a cutting insert having an aperture with a circular cross-section formed therethrough, said insert being disposed on said shim member in such a manner that said aperture communicates with said bore of said shim member; and

a locking pin of a circular cross-section for clamping said cutting insert in said tool-holder, said locking pin having a rod portion, a head portion, and a radially outwardly protruding flange portion disposed between said rod portion and said head portion;



said locking pin being formed so that said flange portion is concentric to said rod portion while said head portion is eccentric to said flange portion, said pin being inserted through said aperture of said cutting insert and said bore of said shim member into said pin-receiving hole of said tool-holder for rotation, with said rod portion and said flange portion being received in said pin-receiving hole of said tool-holder and said bore of said shim member, respectively, so that said head portion is held in abutting engagement with said aperture of said cutting insert to press said insert against said side walls of said holder;

said shim member and said cutting insert being in a form of a figure which is bilateral about at least an axis and radially symmetric and has a center point of radial symmetry; and

said aperture of said cutting insert being located on said center point, and said bore of said shim member being located on said axis but not being on said center point.

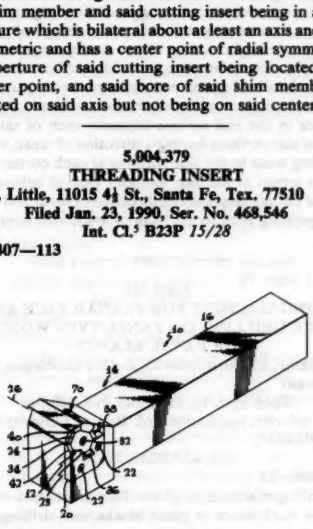
5,004,379
THREADING INSERT

Roger W. Little, 11015 4½ St., Santa Fe, Tex. 77510

Filed Jan. 23, 1990, Ser. No. 468,546

Int. Cl.[5] B23P *15/28*

U.S. Cl. 407—113 7 Claims



1. A threading apparatus comprising:

an insert having a mount portion with at least three straight insert locating sides lying on the sides of an imaginary regular polygon, said insert having a radially outwardly extending arm at each of the corners of said imaginary polygon, with each arm having an outer edge and a pair of opposite sides that extend in a largely radially outward

direction from the axis of said polygon, and with each arm forming a cutting edge at the intersection of the outer edge and each of the sides of the arm;

a tool holder having a recess that holds said insert, said recess having walls forming a plurality of straight holder positioning surfaces that abut said insert location sides and having a clamp that presses said insert firmly at one of said insert location sides against positioning surfaces, whereby to accurately locate said insert.

5,004,380

CUTTING INSERT

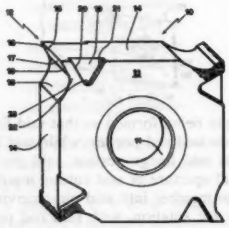
Ingemar Hessman; Karl G. Y. Post, and Lars E. Norgren, all of Sandviken, Sweden, assignors to Santrade Limited, Lucerne, Switzerland

Continuation of Ser. No. 565,215, Dec. 23, 1983, abandoned. This application Jul. 10, 1987, Ser. No. 71,918

Claims priority, application Sweden, Dec. 27, 1982, 8207421

Int. Cl.[5] B23B *27/00*

U.S. Cl. 407—114 7 Claims



1. A replaceable slot-cutting milling insert for a rotary slot milling tool, said insert having the configuration of a parallelepiped with two parallel side surfaces and four end surfaces extending therebetween to define four corners, and wherein each said corner comprises a major cutting edge provided at the juncture between two adjacent end surfaces and perpendicular to the side surfaces, two minor cutting edges defined by the lines of juncture between said side surfaces and one end surface, each of said minor cutting edges being perpendicular to an adjacent major cutting edge, and a concave chip receiving surface in the end surface adjacent each of said cutting edges, said side surfaces having a direction of wear, and means for reducing wear in the side surfaces at each corner comprising recess means in the side surfaces located behind each of said minor cutting edges in the direction of wear and a narrow flange separating each recess from its associated minor cutting edge.

5,004,381

DRILLING MACHINE FOR PLANAR FACE AND/OR END FACE DRILLING ON PANEL-TYPE WORKPIECES OR PANEL BLANKS

Erwin Jenkner, Linden Strasse 13, D-7261 Gechingen, Fed. Rep. of Germany

Filed Mar. 16, 1988, Ser. No. 168,649

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1987, 8704263[U]

Int. Cl.[5] B23B *39/16*

U.S. Cl. 408—31 5 Claims

1. A drilling machine for planar face or end face drilling on panel-type workpieces or panel blanks, said drilling machine comprising:

a workpiece supporting table having a supporting surface thereon;

a workpiece advancing device operably associated with said workpiece supporting table;

said workpiece advancing device further having a front end;

a workpiece slider operably associated with said workpiece advancing device and advanceable along a direction of advance;

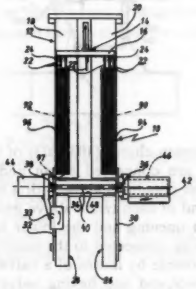
a drilling device, having an operating side, positioned at a front end of said workpiece advancing device;

said drilling device further being displaceable and immobilizable along a direction of displacement transverse to said direction of advance and parallel to said supporting surface of said workpiece supporting table;

said drilling device being further operably positioned transversely to said direction of advance of said workpiece slider;

means for displacing said drilling device along said direction of displacement transversely to said direction of advance and parallel to said supporting surface;

said drilling device having one or more drilling units operably associated with said drilling device for planar face drilling, and one or more drilling units operably associated with said drilling device for end face drilling;



said one or more drilling units for end face drilling having associated therewith at least one drill spindle for end face drilling in said direction of advance of said workpiece slider, which is adjustable in a direction perpendicular to said workpiece supporting surface;

two workpiece aligning tables operably associated with said drilling device and positioned proximate to said operating side of said drilling device, in spaced, parallel relation to each other, opposite said workpiece advancing device, each said workpiece aligning table having a plurality of sides so as to enable substantially continuous operation of said drilling device upon workpieces positioned on said two workpiece aligning tables, in alternating fashion;

at least one housing side stop operably associated with each of said workpiece aligning tables at a side thereof; and

a clamping device operably associated with said workpiece supporting table for fixing workpieces or panel blanks thereon.

5,004,382

MIST-SPOUTING TYPE DRILLING DEVICE

Yousuke Yoshino, Kawagoe, Japan, assignor to Yoshino Seiki Inc., Kawagoe, Japan

Continuation of Ser. No. 318,136, Mar. 2, 1989, abandoned. This application Mar. 7, 1990, Ser. No. 492,306

Claims priority, application Japan, Mar. 3, 1988, 63-50423; Apr. 2, 1988, 63-44829[U]; Apr. 2, 1988, 63-44830[U]; Dec. 5, 1988, 63-158388[U]; Dec. 6, 1988, 63-158637[U]

Int. Cl.[5] B23B *51/06*

U.S. Cl. 408—60 6 Claims

1. A portable drilling device comprising:

(a) a rotary drill having:

(i) a cutting bit at its distal end;

(ii) a mist flow passage extending its axial length;

(iii) at least one aperture in its distal end for the ejection of mist, said at least one aperture being in communication with said mist flow passage; and

(iv) an aperture at its proximal end for the introduction of mist into said mist flow passage, said aperture being in fluid communication with said mist flow passage;

(b) a drill driving means having:

(i) first means for detachably gripping said rotary drill;

(ii) second means for rotating said rotary drill;

(iii) a mist chamber in fluid communication with said aperture in the proximal end of said rotary drill when said rotary drill is gripped by said first means; and

(iv) a mist supplying hole leading from the exterior of said drill driving means to said mist chamber;

(c) third means for atomizing water to create mist, said third means being;

(i) in fluid communication with said mist supplying hole and

(ii) integrally mounted on said drill driving means;

(d) a throat nozzle received in said mist flow passage; and

(e) an elastic sleeve disposed between said throat nozzle and said mist flow passage in tightly contacting engagement with each.

5,004,383

TUBE REAMING AND DEBURRING DEVICE

Albert O. Elliott, Jr., Duffield, Va., assignor to Richard Huff and Amanda Huuf, both of Johnson City, Tenn.

Filed Dec. 27, 1989, Ser. No. 457,867

Int. Cl.[5] B23B *51/00*

U.S. Cl. 408—211 **10 Claims**

9. A tube reaming and deburring device for reaming and deburring the end of a tube, said tube end defining inner and outer edges, said device comprising:

a handle member; and

an inner edge cutting assembly for being supported on said handle including a first blade support member having a forward portion defining a conical surface and a rearward portion, and including a plurality of elongated, replaceable blade members mounted on said conical surface, each said blade member defining first and second end portions and having at least one cutting edge for engaging said inner edge of said tube end, said first blade support member being provided with a plurality of blade mounting grooves radially disposed in said conical surface for releasably receiving said blade members, said forward portion of said first blade support member being provided with a first coaxial threaded receptor for receiving a screw, said screw having a head portion for engaging said first end portions of said blade members as said screw is seated in said threaded recess thereby releasably holding said blade members in said grooves.

5,004,384

DRILL

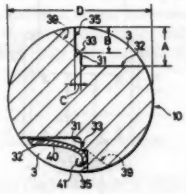
Toshiaki Hosoi, 9-10, Kamiminami 5-chome, Hirano-ku, Osaka-shi, Osaka-fu, Japan

Filed Mar. 6, 1989, Ser. No. 319,582

Claims priority, application Japan, Mar. 11, 1988, 63-58974; Apr. 12, 1988, 63-89568

Int. Cl.[5] B23B *51/02*

U.S. Cl. 408—230 **5 Claims**



1. A drill comprising:

a shank formed with flutes for discharging chips therethrough;

a pair of cutting edges formed at one end of said shank, said cutting edges including an inner edge portion extending from the center of rotation of the drill to an intermediate point and an outer edge portion extending from said intermediate point to the periphery of the drill, said inner edge portion and said outer edge portion being continuous;

said flutes being approximately L-shaped in cross section and being defined by a forward wall positioned forward with respect to the direction of rotation of the drill and a rearward wall positioned rearward with respect to the direction of rotation of the drill, said rearward wall being disposed generally at an angle of 85° to 100° relative to said forward wall such that said forward wall substantially prevents the produced chips from curling, said forward wall having an inner portion and an outer portion, said inner portion being disposed radially inwardly of said outer portion, said outer portion being positioned forwardly of said inner portion with respect to the direction of rotation of the drill, said flute having a radial depth in cross section of 0.25 to 0.40 times the diameter of the drill.

5,004,385

CHAMFERING MACHINE

Katsunobu Kishi, Tokyo, Japan, assignor to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Feb. 21, 1990, Ser. No. 482,499

Claims priority, application Japan, Feb. 27, 1989, 1-21855[U]

Int. Cl.[5] B23C *5/14*

U.S. Cl. 409—180 **7 Claims**

1. A chamfering machine comprising:

a rotary shaft having a shoulder which includes a first projecting portion, and a threaded terminal end;

a guide base oriented perpendicularly with respect to said rotary shaft;

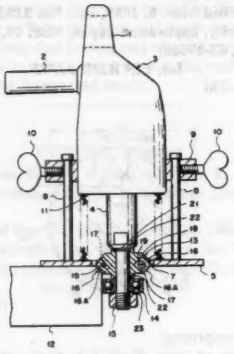
adjusting means for allowing adjustable movement between said rotary shaft and said guide base so as to achieve a selected relative positional relationship therebetween;

a cutter detachably mounted on said rotary shaft, for chamfering an edge of a workpiece;

a guide detachably mounted on said rotary shaft, for contacting a lateral face of said workpiece; and

fixing means having a lock nut defining a second projecting portion threaded onto said terminal end of said rotary shaft, for positionally fixing said guide to said rotary shaft so as to maintain a selected vertical positional relationship between said guide and said cutter, wherein

said cutter includes a holder and cutting tips fixed to said holder, said holder defining recessed portions at both ends



thereof that are engageable with respective ones of said first and second projecting portions.

5,004,386
PROTECTIVE COVER FOR RAILCAR HITCH
Kenneth D. Schmidt, and Jan D. Holt, both of St. Charles, Mo., assignors to ACF Industries, Inc., Earth City, Mo.
Filed Oct. 2, 1989, Ser. No. 415,716
Int. Cl.[5] B60P *3/073*
U.S. Cl. 410—62 **11 Claims**

1. A protective cover for a trailer hitch for use on a railcar, the hitch having a support means, a hitch head carried by the support means, a locking mechanism for latching the hitch in an upright, erect position, and a release mechanism for releasing the hitch from its erect position thereby to allow the hitch to move toward a retracted position, said cover comprising:

a cover plate overlying at least a portion of said locking mechanism and said release mechanism when the hitch is in either its erect or retracted position;

means for pivotally mounting said cover plate adjacent said support means for permitting movement of said cover plate with the support means as the hitch is erected and retracted; and,

means for maintaining said cover plate in its proper position relative to the support means as the hitch is erected and retracted.

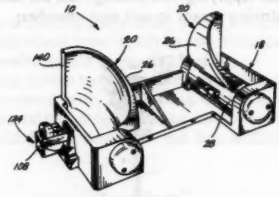
5,004,387
ROLLOUT STOP
Tom M. Jensen, Kirkland, and Thomas H. Shorey, Mill Creek, both of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Nov. 17, 1989, Ser. No. 438,604
Int. Cl.[5] B60P *1/64*
U.S. Cl. 410—69 **15 Claims**

1. A stop assembly allowing a body to pass over it in one direction but obstructing passage in the opposite direction, said stop assembly comprising:

a frame;

a stop rotatably mounted in said frame and having a vane normally extending upwardly into the path of movement of a body;

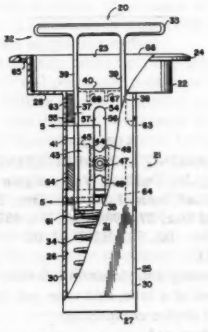
said vane having a camming surface engagable with a first side of and the bottom of the body for causing said vane to rotate out of the path of the body upon engagement therewith, said vane rotating about an axis lying substantially parallel to the direction of movement of the body;



means for rotating said vane back into the path of the body after the body has passed beyond the vane; and

said vane having an abutment surface oriented substantially parallel to said first side of the body and engagable with the body after said vane has been rotated back to its normal upright position to prevent backward movement of the body.

5,004,388
RETRACTABLE CLEAT DEVICE
Halford S. Harris, South Pine Ave., Live Oak, Fla. 32060
Filed Dec. 5, 1988, Ser. No. 279,994
Int. Cl.[5] B63B *21/04*
U.S. Cl. 410—107 **6 Claims**



1. A retractable device for installation in a deck of a boat comprising an elongated vertical hollow unitary housing adaptable for mounting in and to a deck, said housing having a top surface adapted to be mounted flush with the deck, an elongated retractable member slidably positioned in said housing and movable vertically therein, said member having an upper surface substantially flush with said top surface of said housing in a retracted position; mounting means between said housing and said member for limiting the vertical movement of said member, selective operating means for moving said member from a first position wherein an upper end portion of said member is retracted in said housing to position said upper surface flush with said top surface and a second position wherein said member upper end portion is upraised above said top surface of said housing, said selective operating means disposed within said housing and being lockable by a downward force on said upper portion to dispose said upper surface substantially below said top surface of said housing and subse-

quent release to assume said first position and being thereafter releasable by another downward force on said upper end portion to dispose said upper surface substantially below said top surface and subsequent release to assume said second position, said housing having a plurality of interior surfaces, said interior surfaces being located spacedly away from said retractable member to allow movement of said member within said housing and for ease of assembly of said member through said top surface of said housing while said housing is mounted in the deck.

5,004,389

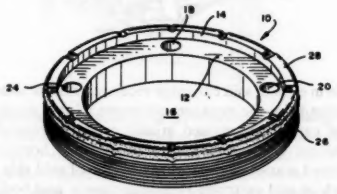
EXTERNALLY THREADED SELF-LOCKING NUT

J. William Spinger, Huron, and Eugene Schlett, Sandusky, both of Ohio, assignors to Industrial Nut Corp., Sandusky, Ohio

Continuation-in-part of Ser. No. 205,957, Jun. 13, 1988, abandoned. This application Jan. 12, 1990, Ser. No. 464,050

Int. Cl.[5] F16B *39/34*

U.S. Cl. 411—304 **6 Claims**



1. A self-locking nut for threaded engagement with an internally threaded cylindrical member, said nut including:

(a) an annular body member;

(b) the outer periphery of said annular body member being threaded for a part of the height thereof, and lying in spaced relation to one end of the body member;

(c) said one end of said annular body member being bent outwardly to provide a collar, thereby forming a peripheral groove between said threaded part of the annular body member and said collar; and

(d) an elastic ring mounted in the peripheral groove and adapted to coact with the mating threads of an internally threaded cylindrical member;

(e) said annular body member collar being crimped to form at least one indentation which engages said elastic ring to form an outwardly extending protuberance on the outer periphery of said elastic ring for creating increased frictional resistance between the outer periphery of said elastic ring and the mating threads of the internally threaded cylinder, to resist relative movement between the nut and the cylindrical member.

5,004,390

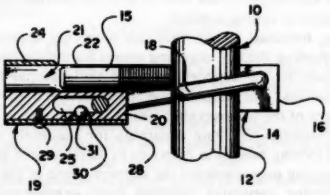
LOCK FOR RETAINER PIN

Carlyen F. Cumbie, 1169 Cole Dr., Lilburn, Ga. 30247

Filed Jan. 8, 1990, Ser. No. 462,052

Int. Cl.[5] F16B *21/02*

U.S. Cl. 411—340 **7 Claims**



1. In a retainer pin including a pin, a head at one end of said pin, and a ring pivotally mounted on said head, said ring being pivotal between a closed position in which a portion of said ring lies against said pin and an open position in which said ring is moved away from said pin, the combination therewith of locking means for said ring, said locking means comprising means for securing said portion of said ring with respect to said pin for preventing motion of said ring away from said pin, said locking means further including a body, said body defining a slot receiving said ring therethrough, said ring being slidable within said slot for allowing said body to be selectively moved to a locking position and to an unlocking position, said locking means further including a detent extending into said slot for inhibiting sliding motion of said ring in said slot, thereby inhibiting motion of said body between said locking position and said unlocking position.

5,004,391

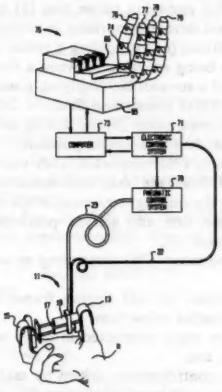
PORTABLE DEXTROUS FORCE FEEDBACK MASTER FOR ROBOT TELEMANIPULATION

Grigore C. Burdea, New York, N.Y., assignor to Rutgers University, New Brunswick, N.J.

Filed Aug. 21, 1989, Ser. No. 396,476

Int. Cl.[5] B25J *3/00*

U.S. Cl. 414—6 **20 Claims**



11. A robot system comprising:

a first support having means for connecting the first support to the thumb of the user's hand;

a second support spaced from said first support and having means for connecting the second support to a finger of the user's hand;

displacement means connected to and extending between said supports, wherein said displacement means includes a sensing means, responsive to linear displacements of said supports with respect to each other, for providing an electrical output signal that is a function of the linear distance between said supports and a slide means for permitting linear displacements of said supports with respect to each other whereby said displacement means can extend adjacent the palm and between the fingers of the user's hand;

a robot hand having end effectors; and

control means connected to the output signal of said sensing means by a flexible line for transmitting said output signal to said control means, and said control means connected to said robot hand for moving the end effectors a predetermined distance with respect to each other in response to the value of the output signal.

5,004,392

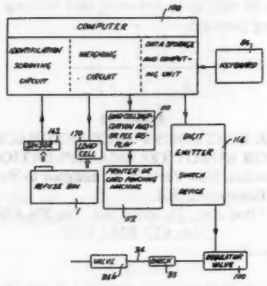
DEVICE FOR EMPTYING CONTAINERS, ESPECIALLY REFUSE BINS

Jakob Naab, Mainz, Fed. Rep. of Germany, assignor to Zöller-Kipper GmbH, Mainz-Laubenheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 131,025, Dec. 10, 1987, abandoned, which is a continuation of Ser. No. 788,939, Oct. 18, 1985, Pat. No. 4,722,656. This application Dec. 28, 1988, Ser. No. 291,240

Int. Cl.[5] B65F 3/04

U.S. Cl. 414—21 **2 Claims**



2. A device for emptying refuse bins (1) into a collecting container (2), said device comprising in combination:

(a) a tipping frame (6) for holding a refuse bin (1), said tipping frame being movable between a first, bin-receiving position and a second, bin-emptying position,

(b) a source (33) of pressurized fluid,

(c) a fluid-actuated motor (9) for shifting said tipping frame between said first and second positions,

(d) valve means (36) connected with said source (33) of pressurized fluid and said fluid-actuated motor (9),for controlling the shifting movement of the tipping frame (6) between said first and second positions by the fluid-actuated motor (9),

(e) said valved means (36) comprising an actuating mechanism,

(f) sensing means on said tipping frame, for sensing the weight of loaded refuse bins,

(h) a regulator valve connected in series with said valved means (36), and

(i) electronic control means driven by said sensing means, for opening said regulator valve by a predetermined amount which automatically varies in accordance with the weight of said loaded refuse bins, such that the speed of the shifting of movement can be correlated to the weight of the bin being emptied.

5,004,393

AUTOLOADER MAGAZINE FOR TAPE CARTRIDGES AND METHOD THEREFOR

Harold A. Lunka, Broomfield, and Christian P. Marlowe, Nederland, both of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Sep. 29, 1989, Ser. No. 414,704

Int. Cl.[5] B65G 1/00

U.S. Cl. 414—331 **27 Claims**

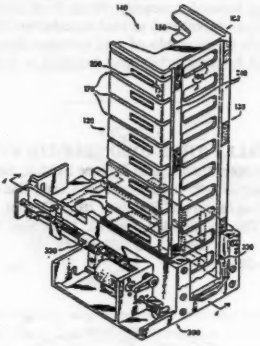
1. A magazine for holding a plurality of magnetic tape cartridges to be loaded in an autoloader, said magazine comprising a rectangular box-shaped body having an open front wall, a rear wall and two side walls,

said body comprising a plurality of vertically-spaced horizontal shelves forming cartridges receiving slots opening into said front wall for insertion of said cartridges,

said body further comprising means to retain said cartridges in said cartridge receiving slots after said insertion,

means to vertically drive said magazine in said autoloader to a selected tape cartridge,

means to release said retention means from said selected cartridge, and



means in each of said cartridge receiving slots to allow direct access from the engagement means of said autoloader to said cartridges retained in said cartridge receiving slots wherein said access means comprise a horizontal slot formed across the full length of one of said side walls in each of said cartridge receiving slots in said body.

5,004,394

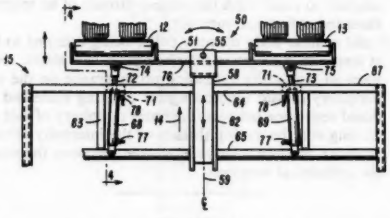
VEHICLE POSITIONING METHODS AND APPARATUS WITH IMPACT DAMPER

Jon D. Goodwin, Cedar Rapids, and Joseph E. Musil, Ely, both of Iowa, assignors to Cedarapids, Inc., Cedar Rapids, Iowa

Filed Dec. 8, 1989, Ser. No. 448,055

Int. Cl.[5] B65G 67/02

U.S. Cl. 414—346 **20 Claims**



10. In road construction material receiving apparatus for receiving material from a supply vehicle, apparatus for positioning a material supply vehicle with respect to the material receiving apparatus, comprising:

a support frame mounted to the material receiving apparatus;

means for engaging the rear of tires of the material supply vehicle in rolling contact;

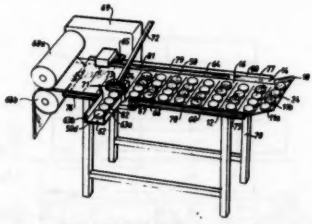
means, mounted to the material receiving apparatus, for supporting the tire engaging means for displacement with respect to the support frame of the material receiving apparatus; and means, interposed between the support means of the tire engaging means and the support frame of the material receiving apparatus, for resiliently receiving and storing energy in response to displacement of the tire engaging means toward the support frame of the material receiving apparatus resulting from engagement of the engaging means with rear tires of the material supply vehicle.

5,004,395

APPARATUS FOR THE EMPTYING OF A PACKAGE BAND AND AN ARRANGEMENT FOR IT

Sven-Olof Berg, Haverdal; Ingemar Broden, Halmstad, and Odvar Johansen, Partille, all of Sweden, assignors to Pronova AB, Halmstad and Aktiebolaget SKF, Goteborg, both of, Sweden

Continuation of Ser. No. 217,363, Jul. 11, 1988, Pat. No. 4,946,339. This application Mar. 27, 1990, Ser. No. 499,907
Claims priority, application Sweden, Jul. 13, 1987, 8702839
Int. Cl.[5] B65B *69/00*
U.S. Cl. 414—412 9 Claims



1. Apparatus for discharging articles from a package which has two walls of flexible material in adjoining relation, first and second sealed edge regions extending longitudinally of the package, a succession of transverse joints spaced longitudinally of the package at which the walls are joined together to form a succession of pockets longitudinally of the package and in which the articles are contained, said apparatus comprising

a support base, means for advancing the package longitudinally with one of said walls resting on said support base, the package being advanced so that successive pockets move past a work station,

means for forming an opening at one of the edges of the package before each of the pockets reaches the work station,

a discharge device at said work station for discharging articles from the pockets in the package, means for transversely moving said discharge device to expel the articles from the pockets at the work station,

means for holding the package relative to the support base to prevent transverse movement of the package while the articles are being expelled from the pockets, and

said discharge device including means for pressing said discharge device against the other of said walls as the discharge device travels transversely to move the walls closer together thereby urging the articles from the pockets through the opening formed in the package.

5,004,396

APPARATUS FOR THE FEEDING OF (PACK) BLANKS TO A PACKAGING MACHINE

Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co., (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Jul. 31, 1989, Ser. No. 387,666
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1988, 3827915
Int. Cl.[5] B65B *43/12*
U.S. Cl. 414—417 17 Claims

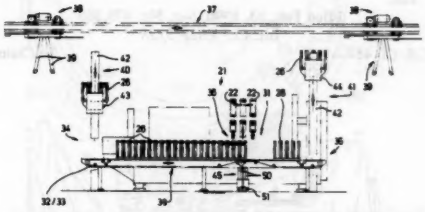
1. An apparatus for feeding pack blanks to a blank magazine of a packaging machine, especially for producing hinge-lid packs for cigarettes, comprising:

a) a plurality of transport cassettes (26) each having several chambers (29), each of said chambers (29) being capable of holding at least one blank stack (22);

b) an above ground conveyor means (37, 38) for transporting the cassettes (26) in a first step;

c) a vertical conveyor means (40) for receiving the cassettes (26) from said above ground conveyor means (37, 38) and feeding the cassettes to a delivery station (34) in a second step;

d) a cassette conveyor means (31), having the delivery station (334), an emptying station (36) and a discharge station (35), and for conveying a corresponding one of the cassettes (26) being in the delivery station (34) to the emptying station (36) and after emptying to the discharge station (35); and



e) a vertical conveyor means (41) for receiving the one cassette which is in the discharge station (335) and transporting the one cassette with an upwardly directed movement; so that

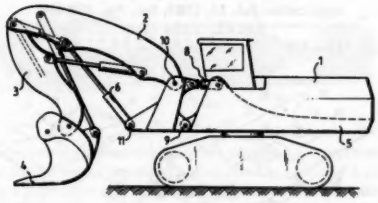
f) said above ground conveyor means (37, 38) receives the one cassette (26) which has been upwardly transported by the vertical conveyor means (41) and transports the one cassette away.

5,004,397

ATTACHMENT HOLDER FOR INTERCHANGEABLE EQUIPMENT ON THE SUPERSTRUCTURE OF A MOBILE SHOVEL EXCAVATOR

Dieter Schwappach, Dortmund, Fed. Rep. of Germany, assignor to O&K Orenstrein & Koppel Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Jun. 28, 1989, Ser. No. 373,933
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1988, 3822247
Int. Cl.[5] E02F *3/36*
U.S. Cl. 414—686 6 Claims



2. An attachment holder for operating equipment on a superstructure of a mobile shovel excavator having an attachment bearing bracket with first bearings, the operating equipment comprising a boom and boom ram having respective second bearings normally connected to said first bearings of the attachment bearing bracket, comprising

an attachment holder, appliable subsequently to the excavator, coupled to the attachment bearing bracket and having, in a forward direction, means comprising pivot shafts for connecting said second bearings of the boom and the boom ram therewith, said pivot shafts being horizontally offset, and said attachment holder has means comprising connection points for connecting said attachment bearing bracket thereto, said connection points being rearwardly spaced from said pivot shafts, and

at least one adjusting cylinder connected to one of said

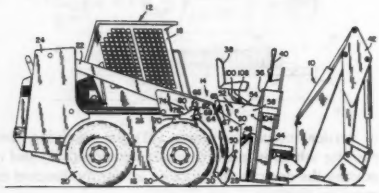
connection points and one of said first bearings movably coupling the attachment holder to the attachment bearing bracket.

5,004,398

BACKHOE MOUNTING DEVICE FOR A SKID STEER LOADER

Oryn B. Wagner, Bismarck, and Terry J. Alm, Mandan, both of N. Dak., assignors to Clark Equipment Company, South Bend, Ind.

Filed Feb. 13, 1990, Ser. No. 479,383
Int. Cl.[5] E02F *3/28*
U.S. Cl. 414—723 30 Claims



1. A mounting device for attaching an implement to a pair of spaced actuating arms on an off road vehicle, comprising:

a carrier frame mounted to the implement;

a mounting frame secured to the arms for engaging the carrier frame;

a lug assembly secured to the implement;

a hook assembly secured to the vehicle for releasibly receiving the lug assembly; and

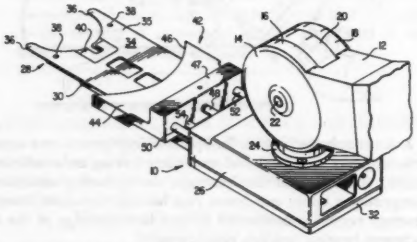
an over center locking assembly movably mounted on the implement for releasibly locking the lug assembly to the hook assembly.

5,004,399

ROBOT SLICE ALIGNING END EFFECTOR

Harold W. Sullivan, Dallas, and Pat M. McConnell, Lucas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 93,327, Sep. 4, 1987, abandoned. This application Jul. 11, 1989, Ser. No. 378,496
Int. Cl.[5] B25J *11/00*
U.S. Cl. 414—729 34 Claims



1. Apparatus for positioning a semiconductor slice relative to a slice carrier, comprising:

a horizontal platform for supporting a semiconductor slice thereon;

means for tilting said platform away from the horizontal, thereby to cause sliding of said slice on said platform; and

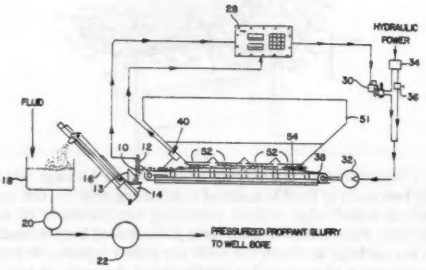
an indexer disposed laterally adjacent said platform, and positioned to receive at least one side of said slice thereagainst, such that said slice is positioned on said platform in a predetermined location.

5,004,400

AUTOMATIC RATE MATCHING SYSTEM

Wayne A. Handke, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Apr. 13, 1989, Ser. No. 337,501
Int. Cl.[5] B65G *65/32*
U.S. Cl. 414—786 9 Claims



1. A method of controlling the delivery of bulk material into a vessel from which delivered bulk material moves, comprising steps of:

(a) generating a control signal for controlling the speed of a means for delivering bulk material to the vessel at an adjustable rate between a minimum rate and a maximum rate;

(b) designating a direction of change in the level of bulk material in the vessel;

(c) generating, in response to the level of bulk material in the vessel, output signals from a plurality of sensors disposed in the vessel;

(d) determining, in response to the output signals, the highest sensor detecting the presence of bulk material in the vessel; and

(e) controlling the control signal in response to the highest sensor determined to be detecting the presence of bulk material in the vessel, including:

(i) in response to said highest sensor being above a mid-range of the sensors, changing the control signal so that the speed of the means for delivering is decreased a predetermined amount;

(ii) in response to said highest sensor being within an upper region of the mid-range of the sensors, changing the control signal to a calculated average control signal in response to a designated increasing level of bulk material in the vessel and maintaining the control signal as is in response to a designated decreasing level of bulk material in the vessel;

(iii) in response to said highest sensor being within a lower region of the mid-range of the sensors, changing the control signal to a calculated average control signal in response to a designated decreasing level of bulk material in the vessel and maintaining the control signal as is in response to a designated increasing level of bulk material in the vessel; and

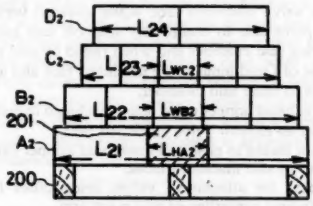
(iv) in response to said highest sensor being below the mid-range of the sensors, changing the control signal so that the speed of the means for delivering is increased a predetermined amount.

5,004,401

LAYER PALLETIZING METHOD

Akira Tsubone; Masanori Tomiyoshi; Junichi Yokomizo, all of Fukuoka; Nobuhiro Tanaka, Saitama; Hideyuki Moriguchi, Saitama, and Eiji Hirata, Saitama, all of Japan, assignors to Kao Corporation, Tokyo and Seibu Electric and Machinery Co., Ltd., Kasuya, both of, Japan

Continuation of Ser. No. 919,011, Oct. 15, 1986, abandoned.
This application Feb. 27, 1989, Ser. No. 316,521
Claims priority, application Japan, Oct. 15, 1985, 60-230273; Mar. 13, 1986, 61-56569; Mar. 24, 1986, 61-65520; Mar. 26, 1986, 61-65823
Int. Cl.[5] B65G *57/26*
U.S. Cl. 414—786 2 Claims



1. A method for palletizing goods of different types in a load with units of layers which is characterized in that a unit load is formed based on the dimensional relation among layer area dimensions of said goods, dimensions of void spaces which are not occupied with said goods and dimensions of said goods and comprising the steps of:

(a) first on a bottom layer having a selected area dimension, establishing a first layer of goods corresponding to said selected area dimension,

(b) establishing subsequent layers vertically above the bottom layer of goods, layers of goods being piled in the unit of layers by holding at opposed pairs of sides, front-back and left-right, a layer of goods in the unit load with pressure by two pairs of palletizers, holding one opposed pair of sides, then releasing such pressure, holding the other opposed pair of sides, and then again holding at both opposed pairs of sides with pressure,

(c) exchanging a vertically upper layer of goods with an immediately subjacent layer when an item of goods of said immediately subjacent layer falls into a void occurring in a layer immediately under said subjacent layer, and

(d) where an unbalanced condition would result from the arrangement of step (c), removing and rearranging the layer having the void instead of exchanging the two layers that would have been placed immediately above said layer having the void.

5,004,402

AXIAL COMPRESSOR STATOR CONSTRUCTION

Herbert L. Burchette, West Palm Beach; Lee E. Hansen, Lake Park; James C. West, West Palm Beach, all of Fla., and Glen A. Nawrocki, Phoenix, Ariz., assignors to United Technologies Corporation, Hartford, Conn.

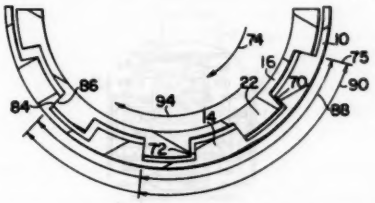
Filed Sep. 5, 1989, Ser. No. 402,744
Int. Cl.[5] F28F *7/00*; F01D *9/00*
U.S. Cl. 415—137 10 Claims

1. A stator construction for an axially split casing compressor comprising:

an axially tapered semicircular casing section of low alpha material having, a circumferentially running axially extending upstream facing casing slot, a plurality of circumferentially spaced inwardly radially extending casing stop lugs;

a partial circular shroud ring of a second higher alpha material in which a plurality of stator vanes are positioned, and a circumferentially running axially extending shroud tongue slideably fit within said casing slot for circumferentially guiding movement of said shroud ring relative to said casing during thermal expansion, and a plurality of circumferentially spaced outwardly radially extending shroud stop lugs, splined with said casing stop lugs;

said casing stop lugs and said shroud stop lugs having mutually abuttable surfaces, the distance between abuttable surfaces of said casing lugs being greater than the distance between abuttable surfaces of said shroud lugs at room



temperature, and with only one shroud stop lug of said partial circular shroud ring in contact with a casing stop lug as installed at room temperature; and

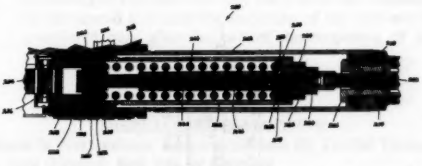
the distance between said abuttable surfaces of said casing lugs being substantially equal to the distance between abuttable surfaces of said shroud lugs at a preselected operating temperature, and substantially all shroud stop lugs in contact with a casing stop lug when said shroud expands and is circumferentially guided.

5,004,403

PRESSURE RESPONSIVE DRIVERS FOR RECIPROCATING PUMP AND METHOD

Samuel W. Culbertson, Arvada, and Keith G. Williams, Longmont, both of Colo., assignors to Binks Manufacturing Company, Franklin Park, Ill.

Continuation-in-part of Ser. No. 162,481, Mar. 1, 1988, abandoned. This application Jul. 27, 1989, Ser. No. 386,456
Int. Cl.[5] F04B *9/06*
U.S. Cl. 417—53 14 Claims



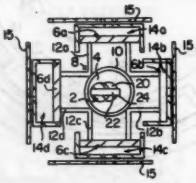
1. A pressure responsive driver for coupling a reciprocating output from a motor means to a reciprocable piston of a pump having a fluid inlet and a fluid outlet, wherein the pressure of fluid at the pump outlet is in accordance with the magnitude of reciprocation forces exerted on the piston, said pressure responsive driver comprising reciprocable input means adapted for connection to the motor means output for being reciprocated thereby; reciprocable output means adapted for connection to the pump piston to reciprocate the piston; and means for coupling said input means to said output means, said coupling means including a single spring for transferring reciprocation forces exerted on said input means by the motor means output from said input means to said output means in both directions of reciprocation and being responsive to the magnitude of transferred reciprocation forces to limit transferred reciprocation forces to a predetermined magnitude while said input means is reciprocated by the motor means output, whereby reciprocation forces exerted on the pump piston are limited to said predetermined magnitude to limit the pressure of fluid at the pump outlet to a selected maximum pressure.

5,004,404

VARIABLE POSITIVE FLUID DISPLACEMENT APPARATUS WITH MOVABLE CHAMBERS

Michel Pierrat, 2355 24th St., Boulder, Colo. 80302

Continuation-in-part of Ser. No. 238,093, Aug. 29, 1988, Pat. No. 4,907,950. This application Feb. 3, 1989, Ser. No. 305,810
The portion of the term of this patent subsequent to Mar. 13, 2007, has been disclaimed.
Int. Cl.[5] F04B 1/10
U.S. Cl. 917—53 11 Claims



10. The method of positively displacing a fluid comprising the steps of

drawing said fluid into first and second displacement chambers having first and second pistons, respectively, slidably mounted therein,

moving each of said pistons along an orbital path and thereby modifying the volume of said chambers, said first and second pistons being positioned in a common cross-sectional plane,

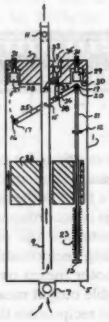
and restricting each of said chambers from movement in a direction parallel with the sliding movement of said piston in said chamber while permitting movement of each of said chambers in another direction.

5,004,405

PNEUMATICALLY POWERED SUBMERSIBLE FLUIDS PUMP WITH INTEGRATED CONTROLS

Michael K. Breslin, 1615 Vendola Dr., San Rafael, Calif. 94903

Filed Aug. 2, 1989, Ser. No. 388,688
Int. Cl.[5] F04F 1/06
U.S. Cl. 417—131 5 Claims



1. Apparatus for the pumping of fluids using compressed gases comprising:

an outer casing having an inlet with a means to allow fluid in and not out,

a hollow fluid discharge tube having its lower end open near the lowermost area of said casing and extending upward and having a means to allow fluid out of said casing and not in,

a housing having the means for mounting air valves and magnets,

a pivoting arm having means to be fixed in said chamber on a pivot pin and having steel rollers fixed too both ends, said pivot arm pivots through an arc during the activation of said pump, the end points of said arc are determined where said steel rollers on said pivot arm contact said housing,

two magnets which are positioned in said housing in a position to attract at least one of said steel rollers at each extreme of said arc,

said pivot arm having means to attach to an air inlet poppet valve assembled in a conduit, in said housing, which connects a pressurized air source to said chamber and also having means to attach to an air exhaust poppet valve assembled in a conduit, in said housing, which connects said chamber with atmospheric pressure,

said air inlet poppet valve being machined to mate against an input valve machined face when lowered vertically by said pivot arm to completely shut off said gasses from entering said chamber and when raised by said pivot arm to rise of f said input valve machined face and allow said gasses to enter said chamber,

said air exhaust poppet valve being machined to mate against against an exhaust valve machined face,

said pivot means to raise and lower said poppet valves onto and off of said machined faces,

said means for attachment valves being offset from the longitudinal centerline of said pivot arm,

said pivot arm having means for a control rod to be

said pivoting arm having means for a control rod to be connected to one of its ends via a pivot pin and extending downward,

said control rod having a stop near its upper extremity and another at its lower extremity and said float being positioned between said stops,

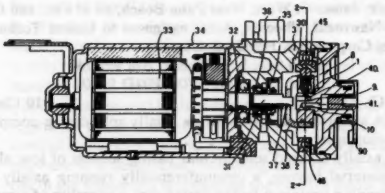
whereby said pivot arm at each extreme of said arc is held in position by at least one of said magnets, and whereby movement of said float against said stops actuates said control rod, thereby pivoting said pivot arm of said valve means through said arc to cause said pivot arm to rest alternately at each extreme of said arc to alternately pressurize and exhaust said chamber through actuation of said poppet valves.

5,004,406

RADIAL PISTON PUMP

Masatoshi Kuroyanagi, Kariya; Masahiko Suzuki, Hoi; Kazuma Matsui, Toyohashi; Makoto Imaeda, Okazaki; Kouzi Nagai, Anjo, and Yoshiaki Ito, Chita, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 22, 1989, Ser. No. 327,081
Claims priority, application Japan, Mar. 23, 1988, 63-68683
Int. Cl.[5] F04B 1/10
U.S. Cl. 417—273 9 Claims



1. A radial piston pump comprising;

a housing in which a cylindrical cylinder chamber is formed,

a rotor rotatably provided within said cylinder chamber in such a manner that a center axis of said rotor is offset from a center axis of said cylinder chamber, said rotor having a working chamber formed therein,

a piston reciprocably provided within said working chamber formed within said rotor,

a bearing provided within said cylinder chamber, an outer race of said bearing being supported by said housing nd an inner face of said bearing being functionally connected with said piston,

a pintle portion provided at the center axis portion of said rotor so that said rotor is rotatably supported by said pintle portion,

a suction groove formed at an outer surface of said pintle portion so that said working chamber will face to said suction groove at certain positions of said rotor, and

a discharge groove formed on an outer surface of said pintle portion so that said working chamber will face to said discharge groove at certain positions of said rotor,

said pintle portion including means for forming a first delay angle at a front side of said suction groove, said first delay angle being more than 40° between a first portion, at which said piston is at a bottom dead point within said working chamber, and a second portion, at which a front edge of said working chamber contacts with said suction groove so that a forcing point at which a pressing force caused by said piston is focused is gradually moved in accordance with a rotation of said rotor.

5,004,407

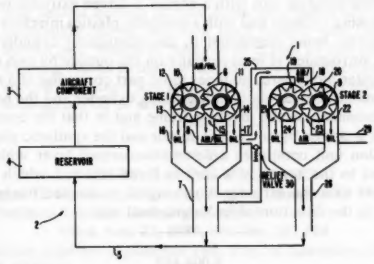
METHOD OF SCAVENGING AIR AND OIL AND GEAR PUMP THEREFOR

Richard M. Hutchison, New London, Wis., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 26, 1989, Ser. No. 412,341

Int. Cl.[5] F04C *2/18, 15/02*

U.S. Cl. 418—1 **15 Claims**



1. A gear pump comprising first and second intermeshing gears capable of being rotatable driven for pumping a liquid, means for housing said first and second intermeshing gears, said housing means including and inlet means for communicating the gear pump with a source of liquid which may contain a gas, the rotation of the intermeshing gears and the resulting centrifugal force on the liquid being pumped causing separation of liquid from the gas where the liquid supplied to the gear pump through said inlet means contains a gas, wherein said housing means further includes first outlet means for discharging only liquid which has been separated from the gas when the liquid supplied to the gear pump contains a gas, and second outlet means for discharging gas and any remaining liquid, wherein said second outlet means in located in said housing means adjacent a mesh zone of the inter meshing gears on a side of the gears opposite to that of the inlet means, and wherein said first outlet means is located in said housing means intermediate said second outlet means and said inlet means such that the first outlet means is located upstream with respect to the travel direction of the gears and the liquid pumped thereby from the mesh zone of the gears and said second outlet means.

5,004,408

DISCHARGE SYSTEM FOR ROTARY ROLLING PISTON COMPRESSOR

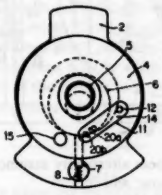
Caio M. F. N. Da Costa, Joinville, Brazil, assignor to Empresa Brasileira De Compressores S/A Embraco, Joinville, Brazil

Filed Oct. 4, 1989, Ser. No. 417,786

Claims priority, application Brazil, Oct. 4, 1988, PI8805216

Int. Cl.[5] F04C *29/08*

U.S. Cl. 418—15 **8 Claims**



1. A rotary rolling piston compressor with improved discharge system comprising:

a housing,

an annular cylinder mounted within said housing;

a bearing and a sub bearing on opposite faces of said cylinder;

a rolling piston eccentrically mounted on a crankshaft rotating within said bearing and sub bearing for rotation within said cylinder;

means within the cylinder defining a discharge chamber and a compression chamber,

discharge valve means on one of said bearing and sub bearings having a discharge outlet in communication with the volume of the cylinder discharge chamber, said discharge outlet having spaced first and second inlets with the second inlet being closer to the chamber defining means and the first inlet located radially inward of the second inlet and angularly displaced relative to the second inlet toward the direction of piston rotation,

the separation and the dimensioning of said first and second gas inlets being such relative to the piston and to each other that the closing of the second inlet by the piston starts upon the end of the closing of the first inlet, the reopening of the first inlet only starts after the reopening of the second inlet and the reopening of the first inlet is completed only after the end of the reopening of the second inlet.

5,004,409

DISPLACEMENT MACHINE

Raoul S. Nakhmanson, Sauerbruchstrasse 49, D-6204 Taunusstein (Neuhof), Fed. Rep. of Germany

Filed Mar. 22, 1989, Ser. No. 327,243

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1988, 3809478; Apr. 28, 1988, 3814311

Int. Cl.[5] F01C *1/00*

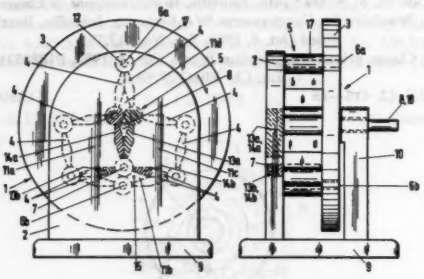
U.S. Cl. 418—58 **27 Claims**

1. An apparatus comprising at least two working chambers with variable volume and at least one inlet opening and one outlet opening for gaseous or liquid media, comprising:

a first stationary plate and a second plate which is arranged parallel to the first plate spaced therefrom, and which is rotatably mounted via its central axis with respect to the first plate;

a plurality of elongated wall elements which are disposed between said plates, and which bear slidingly and sealingly on said plates and together with the plates from the working chambers, each wall element being articulately sealingly connected at its end points (articulation points) to at least one further wall element in such a manner that said wall elements form a movable grid which is rotatably secured with respect to at least one point on the first plate

and with respect to at least two points on the second plate in such a manner that upon rotation of the second plate the



working chambers alternately assume their minimum and maximum volume; and

a shaft mounted in the axis of rotation of the second plate.

5,004,410

HIGH FREQUENCY NOISE SUPPRESSOR FOR HERMETIC ROTARY COMPRESSORS

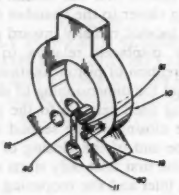
Caio M. F. N. Da Costa, Joinville, Brazil, assignor to Empresa Brasileira de Compressores-S/A-Embraco, Joinville-SC, Brazil

Continuation-in-part of Ser. No. 305,480, Feb. 1, 1989, abandoned. This application Feb. 27, 1990, Ser. No. 488,515

Claims priority, application Brazil, Apr. 2, 1988, PI 8800513

Int. Cl.[5] **F04C** *29/06, 18/356*

U.S. Cl. 418—63 **9 Claims**



1. A suppressor for reducing pulsating noises in a hermetic rotary compressor comprising:

a housing,

a cylinder within said housing,

a bearing on each face of the cylinder,

a piston with an eccentric portion rotating within said cylinder,

a slot in the cylinder,

a vane having a portion riding on the piston eccentric portion to be reciprocated inn the slot, said vane in cooperation with the bearings dividing the space in the cylinder surrounding the piston into a suction chamber and a compression chamber, the vane being tiltable toward one side or the other of the slot depending upon the position of the piston and the pressure differential between the two chambers,

a sound muffling resonating cavity formed in one of the cylinder and bearings, the volume of the sound muffling resonating cavity selected relative to the volume of the compression chamber and frequency of the noise to be muffled to achieve muffling of pulsations of sound of a given frequency,

said vane when tilted toward the compression chamber side providing communication between the compression chamber and the sound muffling resonating cavity and closing the communication when tilted toward the compression chamber side.

5,004,411

APPARATUS FOR THE INTEGRAL MOULDING OF A SYNTHETIC PLASTICS PART

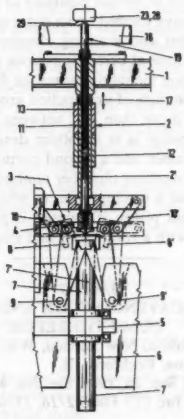
Wilheim Reil, Bensheim, Fed. Rep. of Germany, assignor to Tetra Pak Holdings & Finance S.A., Pully, Switzerland

Filed Apr. 3, 1990, Ser. No. 503,634

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1989, 3911246

Int. Cl.[5] **B29C** *45/48, 45/50, 45/56*

U.S. Cl. 425—117 **6 Claims**



1. An apparatus for the integral molding of a synthetic plastics part on a portion of flexible strip-like material with a total injection molding unit with a nozzle, a driven extruder worm, plasticising cylinder and with a synthetic plastics injection unit, the nozzle being connected to the plasticising cylinder and being surrounded at least partially on the outside by two movable outer mold parts, an inner mold part consisting of a movable mandrel, wherein the plasticising cylinder and the nozzle are stationary on the machine frame and in that the extruder worm is driven by an electric motor and the synthetic plastics injection unit comprises a driven two-armed lever which is subject to the action of a control force unit and which is in contact with the extruder worm which is adapted for movement in the direction of its longitudinal axis.

5,004,412

GEAR MACHINE FOR USE AS A PUMP OR MOTOR

Angelo Zanardi, Corticella; Daniele Mei, Bologna, and Vittorio Toselli, Pianoro, all of Italy, assignors to Sauer-Sundstrand S.p.A., Via Villanova, Italy

Filed Oct. 5, 1989, Ser. No. 417,729

Claims priority, application Italy, Aug. 4, 1988, 3408 A/88

Int. Cl.[5] **F04C** *15/00*

U.S. Cl. 418—132 **16 Claims**

1. A gear machine comprising:

a substantially cylindrical casing having first and second end faces;

a first cover mounted on said casing and opposing said first end face;

a second cover mounted on said casing and opposing said second end face;

a diaphragm arranged between said first cover and said first end face of said casing, said diaphragm contacting said first end face along its entire periphery;

first and second bushes mounted inside said casing and between said second cover and said diaphragm, said first bush being adjacent to said diaphragm and said second bush being adjacent to said second cover, each of said first and second bushes having first and second end faces;

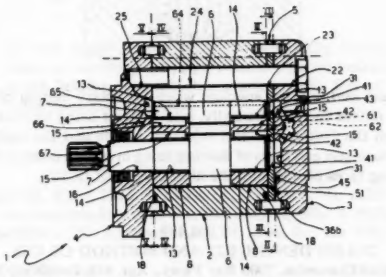
a first shaft rotatably supported by said first and second bushes at first and second relatively axially displaced portions thereof;

a second shaft rotatably supported by said first and second bushes at first and second relatively axially displaced portion thereof and having a third portion which extends outside said casing;

a first gear wheel mounted on said first shaft and having first and second end faces;

a second gear wheel mounted on said second shaft and having first and second end faces, said first and second gear wheels being in mutual engagement; and

means for exerting a pressure on said diaphragm in excess of



a predetermined threshold pressure for urging said diaphragm against said first end face of said first bush,

wherein said first bush is arranged such that upon start-up of said gear machine its second end face is separated from said first end faces of said first and second gear wheels by a first clearance, a central portion of said diaphragm does not move said first bush toward said first and second gear wheels during a start-up period of said gear machine, and said central portion of said diaphragm flexes and correspondingly moves said first bush toward said first and second gear wheels in response to urging by said pressure exerting means to narrow the distance therebetween to a second clearance less than said first clearance after said start-up period of said gear machine.

5,004,413

TABLET MAKING MACHINES

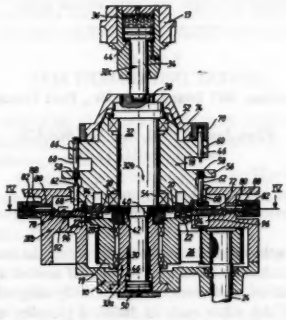
Douglas R. Stopforth, Aigburth, England, assignor to Manesty Machines Limited, Liverpool, England

Filed Aug. 22, 1989, Ser. No. 397,104

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1988, 8815075

Int. Cl.[5] B30B *11/08*

U.S. Cl. 425—182 **4 Claims**



1. In a tablet making machine comprising a frame including a frame proper and a fixed spindle for a rotor mounted on the frame, the fixed rotor spindle being fixed to the frame proper at its opposite ends, a rotor carried by bearings mounted on an intermediate axially extending portion of the spindle, the rotor including a die table carrying dies and opposed pairs of punches, one pair for each die, guided in punch guides of the rotor, the positions of the punches being controlled by first and second fixed cam means carried by the frame, said first fixed cam means controlling one set of corresponding punches of each pair and said second fixed cam means controlling the other set of corresponding punches of each pair, the improvement in that the intermediate, axially extending portion of the spindle is a separate portion of the spindle, which is normally fixed in position between fixed opposite end portions of the spindle by releasable means which, when released, allows the intermediate portion of the spindle to be removed transversely from the machine, together with the rotor and the rotor bearings.

5,004,414

APPARATUS FOR FILTERING PLASTICIZED MATERIALS IN EXTRUDERS AND LIKE MACHINES

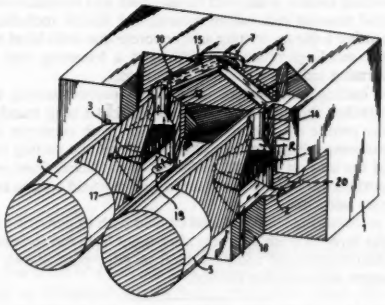
Rolf-Rüdiger Stude, and Ludger Wilken-Trenkamp, both of Münster, Fed. Rep. of Germany, assignors to Kreyenborg Verwaltungen und Beteiligungen KG, Münster, Fed. Rep. of Germany

Filed Dec. 5, 1989, Ser. No. 446,557

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1988, 3840904

Int. Cl.[5] B29C *47/34*; B01D *33/35*

U.S. Cl. 425—185 **6 Claims**



1. Apparatus for filtering a flowable plastic material, comprising a housing having an inlet and an outlet for the plastic material and first and second passages extending between said inlet and said outlet; first and second carriers respectively mounted in said first and second carriers respectively mounted in said first and second passages and movable relative to said housing between first and second positions, each of said carriers having a chamber and filter means provided in the chamber for filtering said plastic material, each chamber communicating with said inlet and said outlet in the first position of the respective carrier so that a stream of plastic material can flow from said inlet, through the filter means in a first direction and into said outlet; through the filter means in a first direction and into said outlet; and means for flushing plastic material out of said chambers and out of the respective carriers, including means for establishing paths along which plastic material can flow through said filter means in a second direction counter to said first direction in the second positions of said carriers so that said plastic material in the respective carriers is completely expelled from the respective carriers before the carriers reassume said first positions wherein said paths are in fluid communication with said inlet and said outlet irrespective to the positions of said carriers.

5,004,415

APPARATUS FOR PRODUCING CONCRETE ROOF TILES

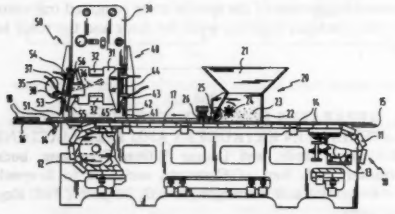
Hans E. Schulz, Bad Soden; Jurgen Braas, Friedrichsdorf, and Friedrich Echl, Mainburg, all of Fed. Rep. of Germany, assignors to Braas & Co. GmbH, Oberursel, Fed. Rep. of Germany

Continuation of Ser. No. 870,932, Jun. 5, 1986, abandoned. This application Mar. 29, 1989, Ser. No. 329,660

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1985, 3522846

Int. Cl.[5] B28B *5/04, 11/14*

U.S. Cl. 425—297 11 Claims



1. Apparatus for making concrete roof tiles from a continuous strip of fresh concrete, comprising:

conveyor means for moving a continuous row of displaceable pallets having concrete thereon along a predetermined path;

a shaper roller and slipper means positioned on said path for compacting and profiling said concrete;

a cutting station positioned on said path and downstream of said shaping and rolling means, said station including a cutting knife for cutting said concrete into individual roof tile moldings of equal length, and a trimming tool for forming individual roof tile moldings;

said cutting knife means including a precompacting tool attached thereto and being formed from a strip matching the profile of a compacted layer of fresh concrete, said precompacting tool being set back from the cutting edge of the cutting knife to compress the adjacent front edge portion of concrete at the same time that said cutting knife cuts said concrete; and

an indentation tool positioned on said path to penetrate into the layer of fresh concrete after it has been cut to contact the concrete and compact the front edge portion over the entire cross section thereof.

5,004,416

INJECTION NOZZLE FOR USE IN AN INJECTION MOULDING DEVICE

Anthonie Van Den Brink, Westmaas, Netherlands, assignor to Eurotool B.V., 'S-Gravendeel, Netherlands

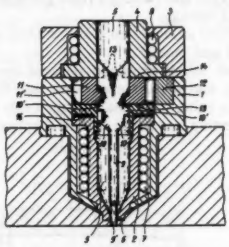
Filed Oct. 30, 1989, Ser. No. 431,311

Claims priority, application Netherlands, Nov. 15, 1988, 8802810

Int. Cl.[5] B29C *45/23*

U.S. Cl. 425—564 5 Claims

1. In an injection nozzle for use in a device for moulding an article made of a thermoplastic material in an injection mould, said injection nozzle comprising a nozzle with at least one feed channel running therethrough, a first end of said injection nozzle operable to receive thermoplastic material and a second end of said injection nozzle connected to an outflow aperture, said second end having a seat mating with an end of an upwardly and downwardly moving shut-off pin running through the feed channel, moving means for moving the pin upwardly and downwardly, said moving means comprising a ring provided with an internal screw thread which engages in such a way with an element which is connected to the pin that, through rotation of the ring, the pin moves upwardly and downwardly and means for setting the ring in rotary motion; the improvement wherein said element connected to the pin projects essentially radially outwardly relative to the pin, said element being situated in the feed channel and permitting passage of the thermoplastic material through said feed channel and said outflow aperture when the rotary motion of the ring moves the pin upwardly, said element being located between the first end of said injection nozzle and the outflow aperture, and end faces of the ring being in sealing contact with sealing faces provided in the nozzle.



5,004,417

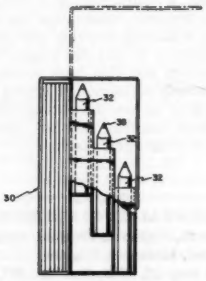
COLOR DENTAL KIT AND METHOD OF USE

Michael Giaramita, 7000 Bay Pkwy., Apt. 6H, Brooklyn, N.Y. 11204

Filed Sep. 12, 1988, Ser. No. 243,415

Int. Cl.[5] A61C *19/10*

U.S. Cl. 433—26 9 Claims



1. A color dental kit for use in specifying color characteristics of individual synthetic teeth, dental elements such as crowns and the like comprising, a plurality of color pencils for coloring of an image of a synthetic tooth in gingival and incisal shades simulating those shades in nature, and including sheets of paper divided into light and dark incisal tones.

5,004,418

DENTAL INSTRUMENT MAT

Paul D. Porteous, 607 Island View Dr., Port Hueneme, Calif. 93041

Filed Jan. 3, 1990, Ser. No. 460,524

Int. Cl.[5] A61G *15/00*

U.S. Cl. 433—77 9 Claims

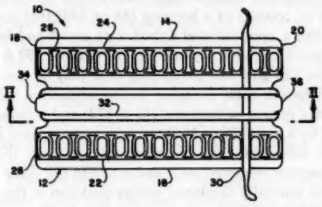
1. A dental instrument mat comprising:

a base portion having two opposite sides and two opposite ends;

a pair of racks formed longitudinally along the two opposite sides, each rack having a plurality of spaced apart teeth, the teeth of each rack being laterally aligned with the teeth of the other rack to define a plurality of laterally disposed holding slots, each being capable of holding a dental instrument, said holding slots being substantially

free of frictional constraining means for holding said dental instruments; and

removable retaining means, detachably coupled to the base portion, for tautly engaging an upwardly disposed surface



of each dental instrument and downwardly biasing the same, to thereby positionally maintain dental instruments in the holding slots which are substantially free of frictional constraining means.

5,004,419

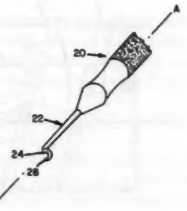
SCALERS FOR PERIODONTAL USE

Joseph M. Kline, 3501 N. Valley St., Arlington, Va. 22207

Continuation-in-part of Ser. No. 348,416, May 8, 1989, abandoned. This application Jan. 26, 1990, Ser. No. 470,785

Int. Cl.[5] A61C *17/00*

U.S. Cl. 433—143 **18 Claims**



13. In a scaler having a handle and at least one working end portion for scaling the surface of teeth wherein the surface of the teeth have a generally arcuate configuration the improvement comprising, the working end having a cutting blade extending therefrom, said working end extending longitudinally outwardly with respect to the central elongated axis of the handle said cutting blade having an inner concave portion and an outer convex portion, said outer convex portion of said cutting blade being rounded, said inner concave portion including a cutting edge which is arcuately shaped in a plane oriented transversely with respect to the central elongated axis of the handle so as to be complimentary to the arcuate surface of a tooth, whereby said cutting edge portion will continuously contact an arcuate segment of the surface of the tooth during scaling.

5,004,420

DENTAL BRIDGE AND MANNER FOR PREPARATION

Per O. Söderberg, Stockholm, Sweden, assignor to Astra Meditec Aktiebolag, Mölndal, Sweden

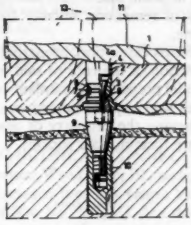
Filed Apr. 20, 1988, Ser. No. 183,891

Claims priority, application Sweden, Apr. 22, 1987, 8701653

Int. Cl.[5] A61C *13/12*

U.S. Cl. 433—172 **10 Claims**

1. A dental assembly comprising a bridge component and a plurality of sockets that are adapted to be attached to anchoring elements affixed to a patient's jawbone, each socket being of a material selected from the group consisting of titanium and an alloy of titanium, having a retention portion embedded in the bridge component that is shaped to lock the socket mechanically against axial movement, and being cast in place in the bridge component to form the mechanical lock, and the



bridge component being of a gold alloy having a melting point not greater than 1050° C.

5,004,421

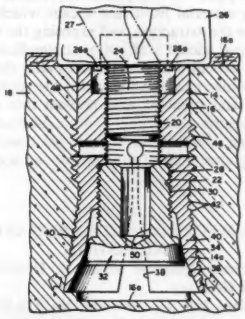
DENTAL IMPLANT AND METHOD OF USING SAME

Sargon Lazarof, 15215 Magnolia Blvd., #126, Sherman Oaks, Calif. 91403

Filed Jul. 27, 1990, Ser. No. 558,494

Int. Cl.[5] A61C *8/00*

U.S. Cl. 433—173 **15 Claims**



1. A dental implant for securement within a bore provided in the jaw bone of a patient, said implant comprising:

(a) an elongated hollow body receivable within the bore provided in the jaw bone of the patient, said body having first and second internal threads said first internal threads being adapted to threadably receive a prosthetic component, said hollow body including:

(i) means for resisting rotation of said hollow body within the bore upon the exertion of a rotational force tending to retract said hollow body from the bore;

(ii) a skirt portion movable from a first retracted position to a second expanded position; and

(b) expander means including a shank portion having external threads mateable with said second internal threads of said body for moving said skirt portion from said first retracted position to said second expanded position upon rotation of said shank portion.

5,004,422

ORAL ENDOSTEAL IMPLANTS AND A PROCESS FOR PREPARING AND IMPLANTING THEM

Robert H. Propper, 401 N. Garfield, Alhambra, Calif. 91801

Filed Nov. 9, 1989, Ser. No. 435,073

Int. Cl.[5] A61C *8/00*

U.S. Cl. 433—175 **9 Claims**

1. The process of providing an endosteal implant for the

human jaw, comprising the following steps in the order recited:

a. extracting a tooth to leave a socket for later reception of an endosteal implant, said socket having a socket wall and the property of remaining suitably fresh for a sufficient period of time;

b. promptly after its extraction, preparing a model of at least the major portion of the root of said extracted tooth;

c. from said model preparing an implant comprising a replica of said model, said implant having an outer surface made of material having the property of osseointegration with bony structure forming said socket;

EXTRACT TOOTH
MAKE METAL IMPLANT OF AT LEAST A SUBSTANTIAL PORTION OF THE ROOT OF THE EXTRACTED TOOTH
PLACE THE IMPLANT IN THE SOCKET FROM WHICH THE TOOTH WAS EXTRACTED WHILE THE SOCKET WAS STILL SUITABLY FRESH
IF ONLY THE ROOT WAS FORMED AS THE IMPLANT, ATTACH CROWN AFTER THE IMPLANT IS STABLE IN THE SOCKET

d. within the period of time the socket remains suitably fresh, removing material from said socket which has accumulated since the extraction, and exposing the bony structure forming said socket wall without significant removal of any bony structure which remained after the extraction so as to minimize change of shape of the socket wall; and

e. inserting and retaining said implant into said socket in surface-to-surface contiguity with a substantial area of the socket wall, whereby to provide for osseointegration of the contiguous areas of the implant and socket wall.

5,004,423

TRAINING AID FOR SUCH SIDE ARMS AS REVOLVERS AND PISTOLS

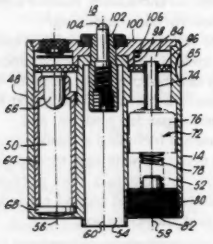
Kurt U. Bertrams, Benrather Strasse 1, D-41010, Düsseldorf, Fed. Rep. of Germany

Filed Jun. 23, 1989, Ser. No. 370,533

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1988, 3822054

Int. Cl.[5] F41G *3/00*

U.S. Cl. 434—22 **20 Claims**



1. In a training aid (10) for such side arms as revolvers and pistols that have a barrel and hammer and comprise a transmitter (18) in the form of a replaceable cylinder (14, when the weapon is a revolver) or of a replaceable insert (114, when the weapon is a pistol or similar piece) and a receiver (16), wherein the transmitter has a release (22) that is activated by the impact of the weapon's hammer (20) and causes the transmitter to emit simultaneously with the impact a brief and narrowly collimated beam (24) of infrared light, the receiver is positioned at a desired distance away and produces a signal when it receives the beam, the beam of infrared light is generated by a diode (66) accommodated in a tube, and the release is at one end of the tube and means (68, 70, or 168) that focuses the beam is at the other end, the improvement wherein the tube is accommodated in or consists of a housing (48 or 148) that is externally shaped like a conventional cylinder or insert and has at least two adjacent cylindrical chambers (50 & 52 or 150 & 172) with their axes (56 and 58) paralleling that (62) of the weapon's barrel, wherein each chamber accommodates a tube (64), a diode, or a system of batteries (72 & 172) and is demarcated at one end by a plate (96 or 196) that is accommodated in another chamber (84 or 184) and has electronic circuitry (FIG. 9) for the transmitter mounted on it and wherein the three chambers constitute mutually displaced spaces enclosed in the one-piece housing (49 or 148).

5,004,424

APPARATUS FOR DEMONSTRATING AND STUDYING THE OPERATION OF A FUEL CELL

James Larminie, Oxford, United Kingdom, assignor to Johnson Matthey Public Limited Company, England

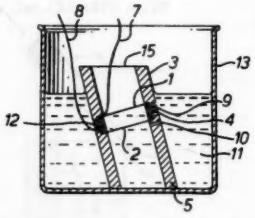
Continuation of Ser. No. 259,732, Oct. 19, 1988, abandoned.

This application Aug. 13, 1990, Ser. No. 566,892

Claims priority, application United Kingdom, Oct. 20, 1987, 8724543

Int. Cl.[5] G09B *23/18*

U.S. Cl. 434—301 **15 Claims**



1. Apparatus for demonstrating and studying the operation of a fuel cell comprising;

a first catalysed electrode which is permeable to oxygen but impermeable to liquid;

a second catalysed electrode;

means for providing an electrical connection to each of the electrodes; and

a housing for holding the first and second electrodes in spaced relationship to each other, the housing being configured such that, when partially immersed in a liquid mixture of fuel and electrolyte, the liquid mixture can circulate freely in contact with one side of the first electrode and both sides of the second electrode, and the other side of the first electrode is exposed to ambient atmosphere.

5,004,425

MAGNETIC SNAP ASSEMBLY FOR CONNECTING GROUNDING CORD TO ELECTRICALLY CONDUCTIVE BODY BAND

Roland Hee, Manilla, Philippines, assignor to JES, L.P., Carlsbad, Calif.

Filed Oct. 10, 1989, Ser. No. 419,409

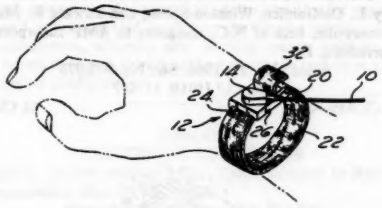
Int. Cl.[5] H01R *4/66*

U.S. Cl. 439—37 **5 Claims**

1. An antistatic body band and ground cord assembly for conducting static electricity away from the wearer's skin, the assembly comprising:

(a) a body having an upper surface and a lower surface, the lower surface having a recess formed therein;

(b) a conductive bottom plate disposed partially within the recess of said body and having an aperture formed therein;
(c) an elastic strip having first and second ends and having conductive fibers woven therein, the first end of said strap having an aperture formed therein and being captured intermediate said bottom plate and said body, the second end of said strap being attachable to said body;
(d) a ferromagnetic flange disposed upon the upper surface of said body, said flange having a generally planer upper surface, a raised ferromagnetic lug formed upon the upper surface, and a conductive shaft formed upon the lower surface of said flange, the shaft extending downward through said body;
(e) a rivet extending through the aperture formed in said bottom plate and through the aperture formed in said elastic strip, said rivet being attached to the shaft o said flange;



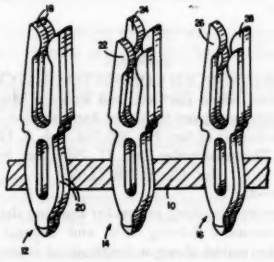
(f) a magnetic connection member having a substantially planar lower surface and a recess formed within the lower surface such that said connection member may couple with said flange, said lug being received within said recess;
(g) a conductive ground cord attached at one end to said connection member;
(h) wherein said magnetic connection member releasably attaches said ground cord to said flange and provides electrical conduction therebetween; and
(i) wherein said bottom plate, said rivet, said shaft, and said flange cooperate to provide electrical conduction from said elastic strap and from the wearer's skin to said magnetic connection member, and also cooperate to attach themselves and said body and the first end of said elastic strap together.

5,004,426

ELECTRICALLY CONNECTING

Roy Barnett, Nashua, N.H., assignor to Teradyne, Inc., Boston, Mass.

Filed Sep. 19, 1989, Ser. No. 409,145
Int. Cl.[5] H05K *1/00*
U.S. Cl. 439—82 **5 Claims**



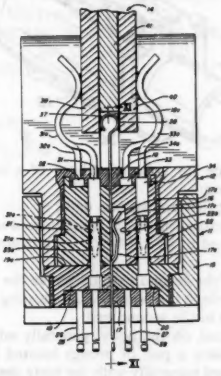
1. An electrical connector comprising
a contact support with a plurality of holes therethrough and
a plurality of contacts extending through at least one of said holes,
each said contact being a forked contact having opposing, integral tines and a space for receiving a mating contact between said tines,
contacts sharing the same hole having their tines and spaces extending in the same direction from said support and being adjacent to each other.

5,004,427

ELECTRICAL CONNECTORS

Richard J. Lindeman, Wood Dale, Ill., assignor to Labinal Components and Systems, Inc., Elk Grove Village, Ill.

Continuation of Ser. No. 297,303, Jan. 13, 1989, abandoned, which is a division of Ser. No. 947,317, Dec. 29, 1986, Pat. No. 4,806,110, which is a continuation-in-part of Ser. No. 876,179, Jun. 19, 1986, Pat. No. 4,710,133. This application May 3, 1990, Ser. No. 518,295
The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.
Int. Cl.[5] H01R *4/66*
U.S. Cl. 439—101 **12 Claims**



1. An electrical connector arranged for low-loss transmission of electrical signals along a plurality of impedance controlled paths between very high speed integrated circuits of first and second circuit means, said connector comprising: first and second ground plane means arranged for coupling to ground means of first and second circuit means and defining highly conductive planar surfaces in first and second ground planes in spaced generally parallel relation to each other, a plurality of signal contact elements arranged in spaced parallel relation to each other and in at least one contact element plane located between and in generally parallel relation to said first and second ground planes, each of said contact elements having a generally uniform spacial relationship to said ground planes with a certain inductance per unit length between each of said contact elements and said ground planes, said contact elements cooperating with said ground planes to define signal propagation paths in the form of electrical transmission lines having characteristic impedances which are functions of the inductances of said elements per unit length and the capacitances per unit length between said elements and said ground plane means, connector means for coupling of opposite ends of each of said contact elements to circuits of said first and second circuit means, and support means of a dielectric insulating material for supporting said signal contact elements in a certain fixed and electrically insulated relation to each other and to said first and second ground planes such that all of said contact elements have the same spacial relationship to said highly conductive surfaces in said first and second ground planes and such as to obtain a certain characteristic impedance which is

the same for all of said plurality of signal propagation paths and which is substantially uniform along the full length of each of said plurality of signal propagation paths through said connector, wherein said first and second ground plane means define planar surfaces of very low inductance and resistance which interconnect the ground plane means of the first and second circuit means to prevent a build-up of any substantial potential difference between the interconnected first and second circuit means and to enhance propagation of very high speed signals between said first and second circuit means.

5,004,428

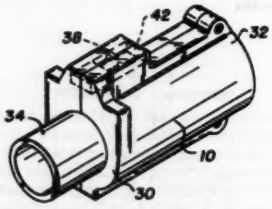
VACUUM SYSTEM ATTACHMENT

Theodore R. Hayden, 10291 Springhill Crescent, Richmond, British Columbia V7E 1W7, Canada

Continuation of Ser. No. 462,904, Jan. 5, 1990, abandoned, which is a continuation of Ser. No. 236,929, Aug. 25, 1988, abandoned. This application Jun. 11, 1990, Ser. No. 537,167

Int. Cl.[5] H01R *4/60*

U.S. Cl. 439—191 **2 Claims**



1. An endpiece for a vacuum hose of a central vacuum system comprising:

a body having first and second ends;

a nozzle projecting outwardly from the first end and adapted to be received in an inlet valve of a central vacuum system;

an opening in the second end to receive the vacuum hose;

a pathway through the body communicating the nozzle and the opening in the second end;

connector means on the body, generally adjacent the first end comprising a pair of prongs located in a protective cavity formed integrally with the body that opens toward said second end and extends away from the inlet valve to allow connection to an electrical power source;

the second end being electrical connected to the connector means whereby electrical current is conducted from the connector means to the second end of the body.

5,004,429

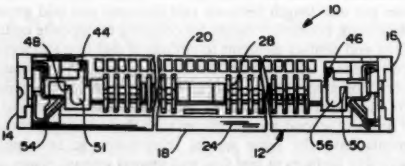
METAL LATCH FOR SIMM SOCKET

Masanori Yagi, Sagamihara, Japan; Anthony M. DiViesti, Park Ridge; Kent E. Regnier, Lombard, both of Ill.; Shoji E. Yamada, Tokyo, Japan, and Alan S. Walse, LaGrange, Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Jul. 16, 1990, Ser. No. 553,016

Int. Cl.[5] H01R *13/00*

U.S. Cl. 439—326 **22 Claims**



1. A latch for use in a socket, said socket being mountable to a circuit board and having a housing defining a slot for receiving an edge of a generally planar circuit module, a plurality of electrically conductive terminals mounted in the housing for engaging the edge of the module inserted into said slot, said housing including at least one rear wall for defining a range of rotational movement of the module in the slot of the housing, the latch being operative for retaining the module in an alignment substantially adjacent the rear wall of the housing, wherein the improvement comprises:

said latch being formed from a metallic material and comprising a housing engaging port for securely engaging the latch to the housing, a board engaging portion for securely engaging the latch and the housing to the circuit board and a deflectable module engaging portion for releasably engaging the module in a selected alignment relative to the rear wall of the housing.

5,004,430

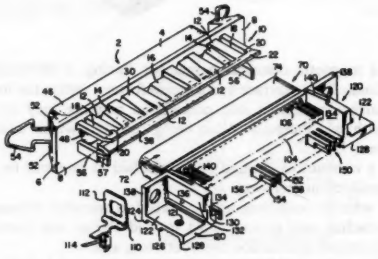
PANEL MOUNT ELECTRICAL CONNECTOR

Henry L. DelGuidice, Winston-Salem, and Edward K. Marsh, Kernersville, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 17, 1986, Ser. No. 932,073

Int. Cl.[5] H01R *13/627*

U.S. Cl. 439—350 **16 Claims**



1. An electrical connector for interconnecting a plurality of conductors and being mountable to a panel having an opening therethrough, the connector comprising:

a first connector portion profiled for mounting on a first side of a panel, the firt connector portion comprising means for latching the first connector portion to the panel, the first connector portion being profiled as a front mating face for receiving a matable electrical connector, and including a wall means mountable against the first side of the panel and a nose portion which extends away from the first side of the wall, the nose portion including an opening therethrough profiled for overlying the opening in the panel;

a second connector portion comrising an insulative housing and a plurality of terminals, the insulative housing and the first connector portion and the first connector portion together.

5,004,431

REINFORCED CONNECTOR LATCH

Mario Previato; Silvio Barbieri, and Roberto Martucci, all of Padova, Italy, assignors to Molex Incorporated, Lisle, Ill.

Continuation-in-part of Ser. No. 306,718, Feb. 6, 1989, Pat. No. 4,900,263. This application Oct. 27, 1989, Ser. No. 428,080

Int. Cl.[5] H01R *13/627*

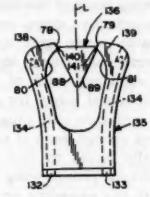
U.S. Cl. 439—358 **16 Claims**

1. An improved latching means for assisting the mating of a connector assembly having first and second connectors adapted to be mated along a longitudinal mating axis, said latching means comprising:

at least one deflectable cantilevered latch arm constructed

from a first material, said latch arm coupled to said first connector;

spring means, constructed from a second material comprising a steel wire insert running substantially throughout the length of said latch arm, for developing and releasing stored energy during the mating of said connectors, said



second material being more resilient than said first material; and

catch means, coupled to said second connector, for engaging and deflecting said latch arm during the mating of said connectors, whereby said latching means employs said stored energy in urging said connector to remain in a fully mated configuration.

5,004,432

ELECTRICAL CONNECTOR

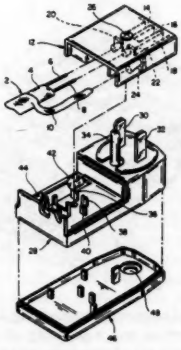
Donald L. Tucker, Redwood City, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Oct. 2, 1989, Ser. No. 415,820

The portion of the term of this patent subsequent to Mar. 26, 2008, has been disclaimed.

Int. Cl.[5] H01R *4/24, 19/08*

U.S. Cl. 439—417 **19 Claims**



1. An electrical connector for a first electrical lead comprising a first conductor and a second conductor, which connector comprises

(1) a conductor-receiving member which comprises

(a) a first channel in which the first conductor can be placed, and

(b) a second channel in which the second conductor can be placed; and

(2) a conductor-connecting member which comprises

(a) a first conductor-contact section,

(b) a first connection-making section,

(c) a second conductor-contact section, and

(d) a second connection-making section;

the conductor-receiving member and the conductor-connecting member being

(i) movable relative to each other between a unique mated configuration and a demated configuration;

(ii) such that in the demated configuration, the first conductor can be placed in the first channel and the second conductor can be placed in the second channel;

(iii) such that if the first conductor has been placed in the first channel and the second conductor has been placed in the second channel, the conductor-receiving member with the conductors placed therein and the conductor-connecting member can then be brought into the mated configuration, in which mated configuration the first conductor makes physical and electrical contact with the first conductor-contact section and the second conductor makes physical and electrical contact with the second conductor-contact section; and

(iv) such that they cannot be brought into the mated configuration if the first conductor or the second conductor has been placed in direct physical contact with the respective conductor-contact section instead of being placed in the respective channel; and

(3) closure means for maintaining the conductor-receiving member and the conductor-connecting member in the mated configuration.

5,004,433

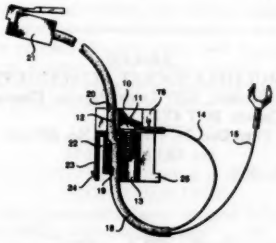
INTERCONNECTION DEVICE

Bassel H. Daoud, Parsippany, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 28, 1989, Ser. No. 399,644

Int. Cl.[5] H01R *11/05*

U.S. Cl. 439—502 **7 Claims**



1. An interconnection device comprising:

means for electrically coupling the device to an outside circuit, said means disposed within an insulating housing;

a pair of wires with ends connected to said means an opposite ends terminating in a plug member adapted for insertion in a socket to provide electrical connection to another outside circuit; and

a recess within said housing adjacent to said means and including therein a portion of said wires so as to provide strain relief for said wires, the recess including a section extending from a top surface of the housing and a section extending from a bottom surface of the housing and where the recesses are offset in the direction from the bottom to the top surface so as to engage and deform the cable into a serpentine configuration to provide strain relief.

5,004,434

PRINTED CIRCUIT BOARD EDGE CONNECTOR

Richard E. Aiello, Tobaccoville; Donald G. Stillie, Winston-Salem, and Christopher L. Allgood, Lewisville, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 493,065, Mar. 12, 1990, abandoned. This application Sep. 28, 1990, Ser. No. 590,541

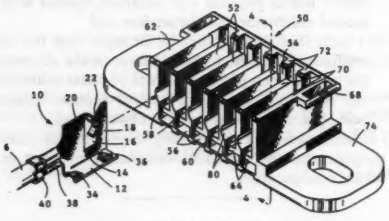
Int. Cl.[5] H01R *23/70*

U.S. Cl. 439—636 **4 Claims**

1. An electrical connector for electrically interconnecting signals from discrete wires to circuits on a circuit board, the connector comprising:

a. housing having spaced walls defining channels for receiving terminals, each having a concave cutout facing into respective said channels and further a circuit board-receiving slot intersecting said channels normal to said walls and located inwardly from the ends of said walls;

terminals having a base, a pair of coplanar arms bent upwardly from one edge of said base with a slot between said arms, a cantilever contact spring arm attached at one end to one of said arms and having a contact surface transverse



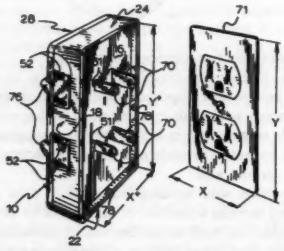
to the plane of said arms and wire attaching means attached to a free edge of one of said arms and extending outwardly therefrom, said terminals disposed in said channels with said slots being in alignment with said slot in said housing and said wire attaching means being received in said concave cutouts and said contact surfaces on said contact spring arm protruding resiliently into said board-receiving slot to electrically engage a circuit board therein.

5,004,435

MULTIPLE SOCKET ATTACHMENT

Jean-Claude Jammet, 4237 Louis Payette, Chomedey, Laval, Québec, Canada H7T 4Y2

Filed Dec. 26, 1989, Ser. No. 457,102
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—652 **8 Claims**



1. A multiple socket attachment adapted to be inserted in a conventional electric wall outlet for electrically bridging the wall outlet and the prongs of an appliance cord plug, said attachment comprising:

a rectangular base plate having a central longitudinal axis;

two lateral ledges parallel to said axis extending perpendicularly from said base plate on one side thereof;

at least one insulating unit longitudinally extending from one of said ledges to the other, each of said unit comprising:

a pair of adjacent parallel and substantially identical transversal sections, each of said sections comprising:

a flat wall extending between said two lateral ledges, the flat walls of said pair of sections being parallel;

an irregular wall parallel to said flat wall also extending between said two lateral ledges; the irregular walls of said pair of sections being located between said flat walls for defining two parallel transversal insulating channels; each of said irregular walls defining a longitudinal insulating channel, off-center from said central longitudinal axis of said base plate and extending from said transversal insulating channel towards said irregular wall of said adjacent transversal section, said base plate having a slot therethrough in line with each of said longitudinal insulating channels;

said base plate, said lateral ledges, said flat walls and said irregular walls being made of insulating material.

a pair of linear conductive strips, each of said strips extending edgewise inside said transversal insulating channels between said lateral ledges, and having a spring clip at each end, each of said clips facing an aperture in said lateral ledges for gripping one of said prongs of said appliance cord plug; and

a pair of L-shaped prongs, each of said L-shaped prongs being electrically linked to each of said conductive strips, said L-shaped prongs being secured to said strip at 90° therewith and extending on the opposite side of said base plate through one of said slots,

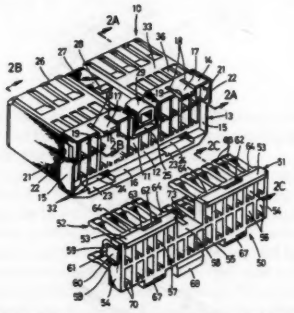
whereby said L-shaped prongs are adapted to be inserted in said conventional electrical wall outlet and said conductive strips electrically link said L-shaped prongs to said spring clips, said spring clips being adapted to receive said prongs of said appliance cord plugs for providing electrical current.

5,004,436

ELECTRICAL CONNECTOR

Koji Aoyama, Tokyo, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 25, 1990, Ser. No. 470,022
Claims priority, application Japan, Mar. 5, 1989, 1-52669
Int. Cl.[5] H01R *13/436*
U.S. Cl. 439—752 **8 Claims**



1. In an electrical connector comprising a dielectric housing having a frame section and a plurality of terminal-receiving cavities to receive electrical terminals, and a dielectric latching member having a frame section provided with openings equal in number to said terminal-receiving cavities and latching arms extending from said frame section into said terminal-receiving cavities and equal in number to said terminal-receiving cavities, the electrical connector being characterized in that:

said housing and said latching member have first latching means at both sides of said housing and said latching member for initially latching said latching member to said housing at a first position;

said terminal-receiving cavities and said openings are aligned in such a manner that the electrical terminals may be inserted through said openings into said terminal-receiving cavities with said latching member in the first position;

said housing and said latching member being provided with slide means to move said latching member forwardly and downwardly to position the front ends of said latching

arms adjacent with sections of the electrical terminals inserted in said terminal-receiving cavities in moving said latching member from the first position to a second position; and

said housing and said latching member including second and third latching means at upper and lower ends between both sides of said housing and said latching member for secondary latching of said latching member to said housing in the second position and wherein said third latching means comprise resilient latching members having hooks positioned at the lower section of the frame section of said latching member and the lower portion of said frame section of said housing having grooves and openings with said latching member disposed in said grooves and said hooks extending through said openings and engaging said frame section of said housing at the second position.

5,004,437

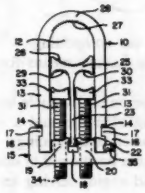
ELECTRICAL CONNECTOR BLOCKS

Gerard S. Walter, Glenshaw, and John Hagan, Gibsonia, both of Pa., assignors to Walter Electrical Manufacturing Company, Pittsburgh, Pa.

Continuation of Ser. No. 734,481, May 16, 1985, abandoned, which is a continuation-in-part of Ser. No. 691,502, Jan. 14, 1985, Pat. No. 4,640,571. This application Mar. 20, 1987, Ser. No. 28,200

Int. Cl.[5] H01R *4/36*

U.S. Cl. 439—811 **1 Claim**



1. An electrical connector block comprising a generally U-shaped housing having a pair of generally parallel elongate sidewalls separated by a trough open on the side opposite the bottom of the U-shaped housing, a groove on each sidewall opposite the trough and spaced from the open side of the trough, at least two cap means having depending arms adapted to slide along the sides of the parallel sidewall over the open trough, said arms having inturned flanges engaged in the grooves of the sidewall, at least one screw member threadingly engaged in each said cap means, each of said screw members carrying a separate clamp member pivoted on the end thereof and independently movable between the sidewalls for clamping at least one wire between each clamp member and a portion of the trough, wherein at least one of said cap means is provided with a pair of depending members between the sidewalls forming a channel intermediate the sidewalls, an inturned flange on each depending member extending partially across the channel to form a trackway, an inverted T-shaped member having an enlarged end on the stem thereof adapted to be supported on said trackway and move vertically in the channel so that the head of the T can move toward and away from the bottom of the U-shaped member, a pair of screw members in the cap means adjacent each of said depending members, a pivotal clamp member on the end of each screw member between a sidewall and the stem of the T member, a clamping surface on the T head facing the bottom of the trough and a clamp surface on the opposite side of the T head between the stem and sidewall whereby a large wire may be clamped between the T head and bottom of the trough and two smaller wires between the clamp member on the screw members and the clamp surfaces on the opposite side of the T head.

5,004,438

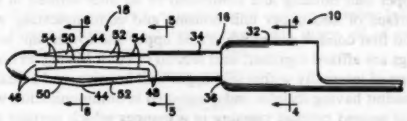
FLEXIBLE PIN TYPE CONTACT

Michael K. Cabourne, Fullerton, Calif., assignor to Precision Interconnect Corporation, Portland, Oreg.

Filed Jul. 3, 1990, Ser. No. 548,291

Int. Cl.[5] H01R *13/05*

U.S. Cl. 439—825 **4 Claims**



1. An electrical pin type contact formed from a metal sheet for wiping engagement with the inner surface of a tubular metal socket, said pin type contact comprising:

(a) a sleeve member having a generally cylindrically formed front end;

(b) a plurality of elongate arm members extending forwardly from and integrally attached to said front end at circumferentially-spaced locations thereon, each respective arm member including forward and rearward elongate opposed arm portions each laterally tapering so as to narrow toward the other to form an intermediate narrowed arm section between said opposed arm portions, the corresponding arm portions of said elongate arm members diverging flexibly from each other as they approach said intermediate narrowed arm sections so that said narrowed arm sections can establish said wiping engagement;

(c) each respective forward and rearward arm portion including opposed elongate edges, said opposed edges of said arm member being folded inwardly toward each other so that said edges cannot wipingly engage the inner surface of said tubular metal socket.

5,004,439

SPEED DETECTING DEVICE FOR MARINE PROPULSION UNIT

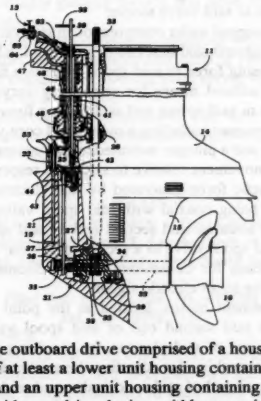
Akihiro Onoue, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jan. 24, 1990, Ser. No. 469,219

Claims priority, application Japan, Jan. 24, 1989, 1-13076

Int. Cl.[5] G01P *5/16*

U.S. Cl. 440—2 **7 Claims**



1. A marine outboard drive comprised of a housing assembly comprised of at least a lower unit housing containing a propulsion device and an upper unit housing containing a drive shaft for driving said propulsion device, said lower unit housing and said upper unit housing having respective surfaces facing each other, means for securing said lower unit housing and said

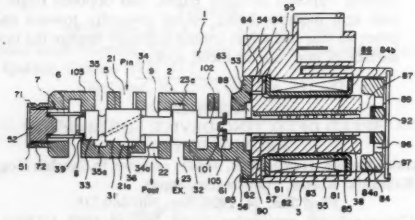
upper unit housing to each other with said surfaces in abutment with each other, and conduit means for conveying a water pressure signal from said outboard drive to a remotely positioned indicator comprising a first conduit section formed in said lower unit housing and extending from an inlet normally positioned below the water line and exposed externally of said lower unit housing to an outlet formed in the surface of said lower unit housing, a second conduit section formed in said upper unit housing and comprised of an inlet formed in said surface of said upper unit housing and communicating with said first conduit outlet when said upper and lower unit housings are affixed together, said second conduit having an outlet formed internally within said upper unit housing, and a flexible conduit having its inlet end connected in communication with said second conduit opening in a manner which permits said upper and said lower unit housings to be assembled when said flexible conduit is in place, the outlet end of said flexible conduit conveying the pressure signal to the remotely positioned indicator.

5,004,440

PRESSURE CONTROL VALVE

Akira Suzuki, Aichi, Japan, assignor to Aisin AW Kabushiki Kaisha, Japan

Filed Dec. 1, 1989, Ser. No. 444,435
Claims priority, application Japan, Dec. 30, 1988, 63-335291
Int. Cl.[5] F15B *13/044*
U.S. Cl. 137—625.65 **8 Claims**



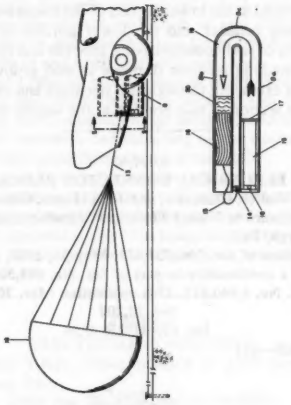
1. A pressure control valve comprising:
a valve sleeve having a support port, an output port, and an exhaust port;
a spool valve having first and second ends and slidably mounted in said valve sleeve;
a spring mounted under compression in said valve sleeve and bearing against said first end of said spool valve for applying a biasing force to said spool valve in a first direction;
spring adjustment means for selectively varying the compression in said spring and said biasing force;
an electromagnet including a cylindrical core with a central opening and a plunger mounted in said central opening for sliding movement relative to said core responsive to electromagnetic force generated by said electromagnet, said plunger being coaxial with said spool valve and having one end abutting said second end of said spool valve to urge said spool valve in a second direction;
control means for controlling said electromagnetic force responsive to an electric signal;
axial adjustment means, located at the point of abutment between said second end of said spool valve and said abutting end of said plunger, for receiving and retaining one or more shims for adjusting the axial spacing between said second end of said spool valve and said abutting end of said plunger; and
an opening in said valve sleeve providing access to the point of abutment between said plunger and said spool valve.

5,004,441

MODEL ROCKET CAR

Jeffrey L. Hammerly, 420 NW. 49th St., Fort Lauderdale, Fla. 33309, and David S. Rosenthal, 1225 Riverside Dr. #505, Coral Springs, Fla. 33071

Filed Dec. 4, 1989, Ser. No. 445,777
Int. Cl.[5] A63H *17/00*
U.S. Cl. 446—211 **4 Claims**



1. A model rocket car comprising:
a miniature vehicle having means for engagement with a support surface;
a "U"-shaped " tube on said vehicle having first and second rearwardly-facing openings and a reversely bent closed passageway between said openings;
a model rocket engine positioned in said tube in front of said first opening, said engine having an exhaust nozzle at its rear end which is open toward said first opening and means at its front end for discharging pressurized gas into said passageway, said engine having ignitable charge means therein for first discharging through said exhaust nozzle at its rear end to propel the car forward and after a burning time for discharging from its front end into said passageway in the tube;
a folded parachute positioned in said tube in front of said second opening to be blown rearward out of said tube and to open in response to the time-delayed discharge from said front end of the engine;
an externally disposed eyelet;
and a flex line connecting said parachute to said eyelet to limit the rearward movement of the parachute when blown out of said tube, whereby said parachute upon opening brakes the forward movement of the vehicle.

5,004,442

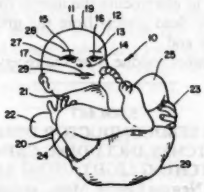
EDUCATIONAL TOYS

Jerome H. Lemelson, and Dorothy Lemelson, both of 48 Parkside Dr., Princeton, N.J. 08540

Filed Jun. 27, 1988, Ser. No. 212,186
Int. Cl.[5] G09B *00/00*
U.S. Cl. 446—302 **20 Claims**

1. An educational toy comprising in combination:
(a) a series of figure toys, each representative of the same living being at a different stage in its growth and development,
(b) each of said figure toys having a head portion and a torso portion connected to said head portion,

(c) the head portion of each of said figure toys having a facial portion,



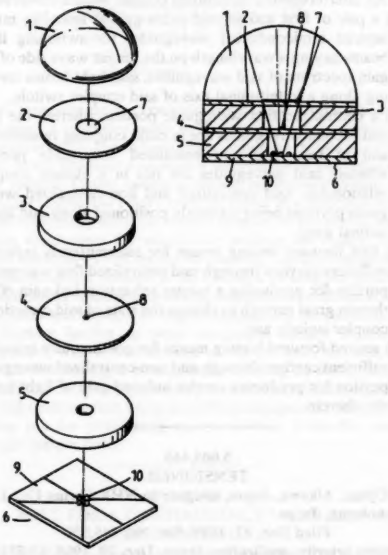
(d) each of said facial portions of each of said figure toys being shaped and decorated to correspond to the same individual at said different stages of its growth.

5,004,443

ELECTRONIC EYEBALL OF DOLL

Michael Su, No. 6, Lane 327, Nan San Road, Chung Ho City, Taipei Hsien, Taiwan

Filed Jan. 22, 1990, Ser. No. 468,251
Int. Cl.[5] A63H *3/38*
U.S. Cl. 446—392 **1 Claim**



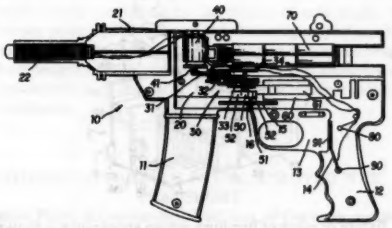
1. An electronically operated doll eyeball comprising:
(a) a substantially transparent, hemispherically contoured convex lens;
(b) a diaphanous screen plate member secured to said convex lens and having a centrally located aperture formed therethrough, said diaphanous screen plate member having a paper member of predetermined color attached thereto and covering said centrally located aperture;
(c) a first disc member having a centrally located first through opening;
(d) a second disc member having a centrally located second through opening;
(e) a transparent film plate member sandwiched between said first and second disc members and secured thereto on opposing sides thereof, said transparent film plate member having a substantially opaque member of predetermined contour secured thereto at a central location; and,
(f) means for illuminating said convex lens, said means for illuminating including a board member mounted to said second disc member and having a plurality of positionally located lighting members mounted thereto, said lighting members being actuated singularly or in combination to provide a changing imaging location of said opaque member on said convex lens dependent upon which of said lighting members is actuated, said opaque member being imaged centrally on said convex lens when all of said lighting members are deactuated.

5,004,444

TOY SUBMACHINE GUN

Hsieh C. Chih, 8F.-5, No. 140, Min Chuan East Rd., Taipei, Taiwan

Filed Aug. 9, 1989, Ser. No. 391,753
Int. Cl.[5] A63H *5/04*
U.S. Cl. 446—406 **4 Claims**



1. A toy submachine gun comprising:
a body housing having a magazine housing and a pistol grip;
a trigger movably connected to said pistol grip;
a plate spring mounted in said body housing and urging against said trigger;
a contact contacting with said plate spring when said trigger is triggered, and mounted in said body housing;
a motor electrically connected to said contact and said plate spring to be energized when said trigger is triggered;
a reduction gear assembly driven by said motor and having an extension shaft;
a rotating arm driven by said shaft and having an eccentrical shaft;
a groove provided in said body housing and capable of reciprocatingly guiding therein said eccentrical shaft;
a sound box;
a striking plate spring capable of engaging with said rotating arm so that each time after said striking plate spring and said arm engage, said striking plate spring will strike said sound box to sound; and
a casing reciprocatingly mounted on said body housing, and mounting therein said motor, said reduction gear assembly and said rotating arm.

5,004,445

DOLLHOUSE WITHIN A DOLLHOUSE

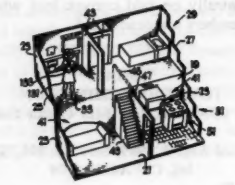
Paula M. Coleman, and Mark T. Luecke, both of Chicago, Ill., assignors to Lewis Galloob Toys, Inc., South San Francisco, Calif.

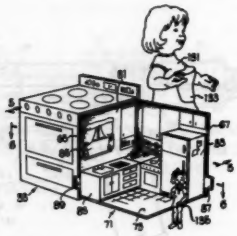
Filed Feb. 6, 1990, Ser. No. 475,709
Int. Cl.[5] A63H *3/52*
U.S. Cl. 446—478 **4 Claims**

1. A toy sized for use with a dollhouse, said toy including:
a hollow container formed of at least two sections,
said sections being connected to each other to permit said sections to be moved between open and closed positions relative to each other,
means applied to the exterior of said hollow container to

provide said container with the appearance of an appliance, a fixture or a piece of furniture that would be found in a house,

means located in the interior of at least one section of said hollow container which means simulate on a small scale a room setting containing at least some of the appliances, fixtures and furnishings which would normally be found in the same type of room of a house as the appliance,





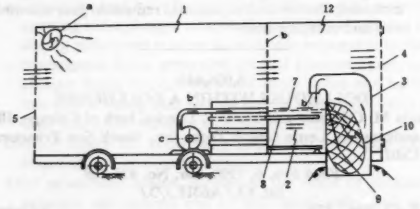
fixture or piece of furniture whose appearance is shown on the exterior of said hollow container, said appliances, fixtures and furniture small scale simulating means being located in at least one of said sections so as to be concealed from view when the sections are moved to their closed positions relative to each other and to be visible in their conventionally oriented positions when the sections are moved to their open positions relative to each other.

5,004,446

DEVICE AND METHOD FOR COLLECTING BEE VENOM BY ATTRACTING AND ELECTROCUTING INJURIOUS BEES

Li Guong-Hong, Highway Transportation Administration Station, Xinyang City, China

Filed Jan. 6, 1989, Ser. No. 294,346
Claims priority, application China, Feb. 14, 1988, 88100579
Int. Cl.[5] A01K *57/00*
U.S. Cl. 449—1 **13 Claims**



9. A method for attracting insects and collecting insect residue, then electrocuting insects, which method comprises:

(a) placing a substance for attracting insects on a collection apparatus, including an electric grid (7) and a residue receiving plate (8);

(b) passing a low voltage electric current through said electric grid to stimulate insects to deposit a residue on the receiving plate;

(c) then passing a high voltage electric current through the electric grid to electrocute the insects thereon;

(d) blowing the dead insects from the grid into a treating container (3); and

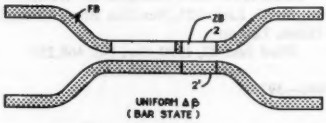
(e) removing insect residue from the receiving plate.

5,004,447

LOW LOSS SEMICONDUCTOR DIRECTIONAL COUPLER SWITCHES INCLUDING GAIN METHOD OF SWITCHING LIGHT USING SAME

Richard A. Soref, Newton Centre, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 6, 1989, Ser. No. 403,636
Int. Cl.[5] G02B *6/10, 6/26;* H01L *27/12*
U.S. Cl. 350—96.14 **19 Claims**



1. An interferometric directional coupler switch comprising:

(a) a pair of first and second index-guided laser-like multilayered semiconductor waveguides for switching light beams having a wavelength on the longer wave side of the gain spectrum of said waveguides, said light beams traveling along a longitudinal axis of said coupler switch;

(b) a centralized first waveguide portion wherein the first and second waveguides are in close coupling relationship and at least one non-centralized waveguide portion wherein said waveguides are not in a closely coupled relationship, said centralized and non-centralized waveguide portions being tandemly positioned along said longitudinal axis;

(c) first forward biasing means for intermittently injecting sufficient carriers through said centralized first waveguide portion for producing a carrier refraction and gain effect therein great enough to change the state of said directional coupler switch; and

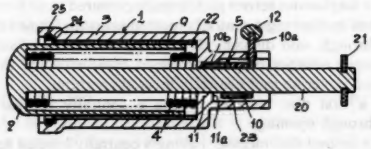
(d) second forward biasing means for continuously injecting sufficient carriers through said non-centralized waveguide portion for producing carrier induced gain of light intensity therein.

5,004,448

TENSIONER

Juji Ojima, Aikawa, Japan, assignor to NHK Spring Co., Ltd., Yokohama, Japan

Filed Dec. 12, 1989, Ser. No. 448,850
Claims priority, application Japan, Dec. 29, 1988, 63-331952
Int. Cl.[5] F16B *2/02, 21/00;* F16D *3/26*
U.S. Cl. 474—111 **5 Claims**



1. A tensioner comprising

a casing,

a tension rod movably mounted in the casing,

a compressing spring mounted in the tension rod between

one end of the casing and one end of the tension rod for energizing the tension rod in an advancing direction, and a friction brake having a coil portion, one end of the coil portion being latched with a rear end of an axially tapered surface formed on the casing for producing a wedging effect, while another end of the coil portion being an operation end being fixable in a locking position for preventing advancement of the tension rod and in an open position for releasing the tension rod.

5,004,449

SEALED TENSIONER

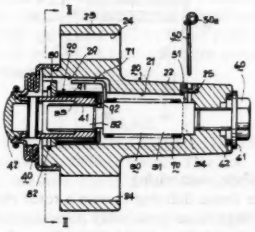
Juji Ojima, Aikawa, Japan, assignor to NHK Spring Co., Ltd., Yokohama, Japan

Filed Dec. 15, 1989, Ser. No. 451,159

Claims priority, application Japan, Dec. 30, 1988, 63-331596; Dec. 7, 1989, 1-318349

Int. Cl.[5] F16H *7/12*

U.S. Cl. 474—138 **5 Claims**



1. A tensioner device comprising a casing, a rotary body in the casing, a tensioner body in the casing having a threaded connection with the rotary body whereby rotation of the rotary body provides translatory movement of the tensioner body relative to the casing, a spring mechanism within the casing for urging the rotary body to rotate in a direction moving the tensioning body outwardly relative to the casing and a locking mechanism for selectively holding the rotary body against rotation by the spring mechanism, the locking mechanism comprising a pin hole in the casing, a locking pin received in said hole for releasable arresting engagement with the rotary body, and a seal element of resilient material in the pin hole, the seal element having an outer peripheral surface in sealing engagement with a wall surface of the pin hole, the seal element further having a throughbore defining an inner peripheral surface, the locking pin being received in said throughbore and said inner surface being in sealing engagement around the locking pin for preventing egress of fluid from the casing through the pin hole.

5,004,450

BELT FOR A CONTINUOUSLY VARIABLE TRANSMISSION

Tohru Ide, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan and Van Doorne's Transmissie B.V., Tilburg, Netherlands

Filed Oct. 27, 1989, Ser. No. 428,342

Claims priority, application Japan, Nov. 4, 1988, 63-280201; Nov. 4, 1988, 63-280202

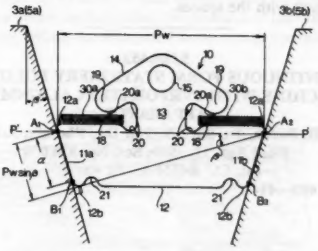
Int. Cl.[5] F16G *1/22*

U.S. Cl. 474—242 **5 Claims**

1. A belt for a continuously variable transmission having a drive pulley and a driven pulley, the belt being engaged with both said pulleys, said belt comprising a plurality of metal elements arranged on an endless carrier, each of said pulleys forms a groove with an angle with respect to a line perpendicular to a rotational axis of said pulley for inserting said elements therein, each of said elements has a body portion of trapezoid shape, both sides of said trapezoid shape contact an inside of said groove, and said carrier supports said elements at a pitch width which is a longer base length of said trapezoid, the improvement in the belt wherein:

each element has a contact length of said both sides with said groove which is shorter than said pitch width multiplied by the sine of said angle; and

corners of said element at the shorter base length of said



trapezoid are formed inside an arc having a radius of said pitch width multiplied by the cosine of said angle, the center point of the radius of the arc being an end point of the contact length of an opposite of said side at the longer base length of said trapezoid, whereby said elements are accurately and regularly kept in said groove without inclination.

5,004,451

FOLDING APPARATUS WITH IMPROVED WEB TRANSPORT

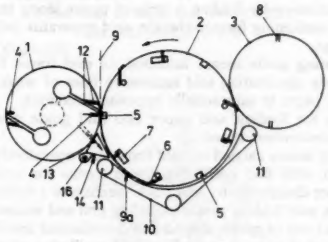
Sebastian Priim, Kaiserslautern, Fed. Rep. of Germany, assignor to Albert-Frankenthal AG, Frankenthal, Fed. Rep. of Germany

Filed Jan. 18, 1990, Ser. No. 477,437

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1989, 3904076

Int. Cl.[5] B31F *1/00, 7/00*

U.S. Cl. 493—359 **8 Claims**



1. A mechanism for an adjustable folding apparatus comprising:

a knife cylinder;

means for causing the knife cylinder to rotate at a speed independent of the supply of a web to be processed;

a mating cylinder with which said knife cylinder is adapted to cooperate at a cutting nip for the production of cut sections from the web and which is provided with grippers to engage and hold leading edges of said cut sections;

a conveyor belt trained about said mating cylinder on a peripheral part thereof extending from said cutting nip, at least one of said knife cylinders forming said cutting nip being provided with ports coming after cutting means on said one cylinder, said ports being adapted to produce a flow of air, said flow of air being directed towards said mating cylinder with said grippers, said ports including blowing ports which are at least present in said knife

cylinder in a part of the periphery thereof arranged after said mating knives and directed towards said mating cylinder, said ports having means for connection with a compressed air supply; and

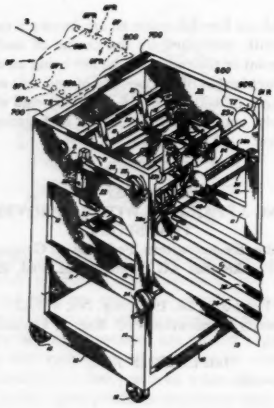
a staionary deflecting means arranged in a widening gap following said cutting nip and ahead of said conveyor belt, said deflecting means including deflector lugs which have spaces between them such that the blowing ports are aligned with the spaces.

5,004,452

CONTINUOUS FORM STATIONERY FOLDING MACHINE WITH PERFORATION ALIGNMENT APPARATUS

Earnest B. Bunch, Jr., 9619 N. 21st Dr., Phoenix, Ariz. 85021

Filed Apr. 11, 1989, Ser. No. 336,079
Int. Cl.[5] B65H *45/20, 45/105*
U.S. Cl. 493—414 **1 Claim**



1. In combination with apparatus for producing continuous form stationery by folding a strip of paper along transverse lines of weakening formed therein, said apparatus including

a frame,

oscillating guide means mounted on said frame for alternately distributing said successive lines of weakening in said paper in substantially opposite directions,

means for feeding said paper into said guide means at a predetermined speed,

folding means carried on said frame and operatively associated with said oscillating guide means for urging said paper distributed by said guide means into a folded condition, said folding means including first and second spaced apart sets of spirals shaped and dimensioned and rotatably driven to receive paper from said oscillating guide means to fold the paper along the transverse lines of weakening,

gear train means for transmitting motive power to said oscillating guide means, feeding means, and folding means such that generally synchronized movement thereinbetween is maintained,

power means to drive said gear train means,

the improvement comprising means for positioning said strip of paper in said apparatus such that a line of weakening is distributed by said guide means when said guide means is in a selected operative position, said positioning means including:

(a) a first fixed positioning mark on said apparatus adjacent said strip of paper moving through said apparatus;

(b) a second fixed positioning mark on said apparatus adjacent a portion of said gear train means;

(c) a rotating shaft in said gear train means and having a portion adjacent said second fixed position mark; and,

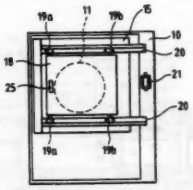
(d) indicator means on said rotating shaft, said indicator means rotating simultaneously with said shaft during operation of said apparatus and including a reference mark; said indicator means being positioned on said rotating shaft such that when said reference mark is aligned with said second mark one of said lines of weakening is adjacent said first positioning mark.

5,004,453

CENTRIFUGE

Hiroshi Hayasaka, and Akio Nagata, both of Katsuta, Japan, assignors to Hitachi Koko Company, Limited, Japan

Filed Jul. 27, 1989, Ser. No. 385,743
Claims priority, application Japan, Jul. 29, 1988, 63-101310[U]; Jul. 29, 1988, 63-191231; Jul. 29, 1988, 63-191232; Jul. 29, 1988, 63-101311[U]; Sep. 9, 1988, 63-119108[U]
Int. Cl.[5] B04B *7/02*
U.S. Cl. 494—39 **11 Claims**



1. A centrifuge, comprising:

(a) an outer frame defining therein a rotor chamber;

(b) a centrifuge rotor detachably disposed in said rotor

(c) a door slidably mounted on said frame for opening and closing said rotor chamber, said door projecting outwardly from said frame when it is disposed in an open position;

a pair or parallel spaced guide rails mounted on said frame for guiding therealong said door, said guide rails having respective rear ends terminating short of a rear end of said frame; and

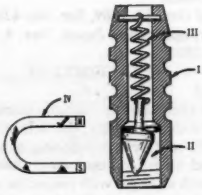
a guide roller rotatably mounted on said frame adjacent to the rear end thereof and rollingly engageable with the underside of said door for supporting said door when said door projects outwardly from said frame.

5,004,454

AUXILIARY INTRA-URETHRAL MAGNETIC VALVE FOR PERSONS SUFFERING FROM URINARY INCONTINENCE

Mordechay Beyar, Caesaria, and Amnon Foux, Haifa, both of Israel, assignors to Technion Research and Development Foundation Ltd., Haifa, Israel

Filed Feb. 7, 1990, Ser. No. 476,211
Claims priority, application Israel, Feb. 15, 1989, 089297
Int. Cl.[5] A61F *2/02, 2/04*
U.S. Cl. 600—30 **6 Claims**



1. An auxiliary urethral valve for insertion into the urethra of a person unable to control his or her bladder function, having a proximal end and a distal end, the valve including a

spring-supported, ferromagnetic valve member adapted to be opened by a magnetic field created by a magnet positioned outside the body of the wearer, said valve comprising:

a tubular casing of a diameter coextensive with the dimension of the urethral duct and made of a nonmagnetic and innocuous material, said tube being lengthwise perforated by a throughgoing passage provided with an inwardly protruding valve seat,

a valve member of a ferromagnetic, innocuous material comprising a valve surface corresponding to said valve seat of said tubular casing, a solid valve body extending from said valve surface and tapering towards its distal end and a spring-engaging portion extending from said valve body in proximal direction,

a tension spring having its distal end fastened to said spring-engaging portion of said valve member and its proximal end fastened to said casing, so dimensioned as to urge said valve member onto said valve seat at normal pressure in the bladder and to permit said valve member to be lifted of said seat by overpressure;

means for opening said valve at normal bladder pressure being effected by tilting of said valve member by a magnetic field, whereby a first portion of said valve surface is lifted off said valve seat and a second portion remains in contact with said valve seat opening a passage for urine from the bladder into the open.

5,004,455

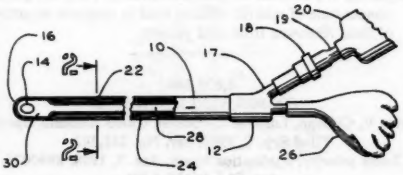
INFECTION-RESISTANT CATHETER

Eugene C. Greenwood, 2956-B Pepper Tree La., Costa Mesa, Calif. 92626, and John Hyatt, 7 Jade Cove, Corona Del Mar, Calif. 92625

Filed Jul. 17, 1989, Ser. No. 380,526

Int. Cl.[5] A61M *3/00*

U.S. Cl. 604—43 **3 Claims**



1. A catheter comprising:

an elastomeric tubular device for passing into the human body containing

a first channel passing through the entire length of said catheter, open proximate one end to the outside of said catheter for receiving fluid, and a means at the other end to contain or dispose of said fluid, and

one or more secondary channels generally parallel to said first channel with closed ends proximate the open end of said first channel, with slits or punctures through the wall to the periphery of said catheter, said slits or punctures being dimensionless and closed by elastic memory until pressurized from within said secondary channel or channels.

5,004,456

IN-DWELLING CATHETER

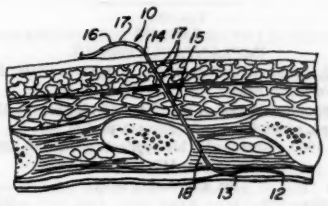
Carl N. Botterbusch, Reading, and Paul L. Frankhouser, Wyomissing, both of Pa., assignors to Arrow International Investment Corporation, Wilmington, Del.

Filed Mar. 10, 1989, Ser. No. 321,768

Int. Cl.[5] A61M *25/00, 25/06*

U.S. Cl. 604—53 **11 Claims**

1. Equipment for administration of fluids, such as an anesthetic or the like, into an elongated body space having a relatively narrow clear space in the direction of access thereto, said equipment comprising a catheter having a first elongated body portion extending proximally from the distal tip and a second elongated body portion extending proximally of said first body portion and joined thereto, said first body portion being formed of a relatively soft bio-compatible resin material and said second portion being of relatively stiff bio-compatible resin material, a lumen extending lengthwise of the catheter having an exit port in said first body portion in the region of the distal tip, the exterior of said second body portion having a reference means for indicating the position of the distal tip of the catheter within the elongated body space, the material of



said first body portion being yieldable upon contact with body tissue within said space without irritation thereto and the material of said second body portion being resistant to collapse and kinking, said reference means comprising a plurality of reference marks disposed on said second body portion, the first of said reference marks being offset from the distal tip of the catheter by an amount equal to the length of an insertion needle used in placement of the catheter and a second of said reference marks placed proximally of the first by an amount equivalent to the insertion length of said first body portion within said body space.

5,004,457

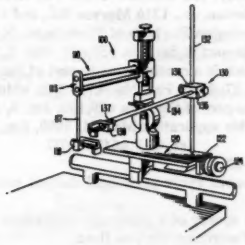
TISSUE TRANSPLANTATION SYSTEM

Richard J. Wyatt, Washington, D.C.; William J. Freed, Ft. Washington, and Richard A. Staub, Waldorf, both of Md., assignors to The United States of Americas as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Dec. 2, 1988, Ser. No. 278,821

Int. Cl.[5] A61M *5/178*

U.S. Cl. 604—158 **4 Claims**



1. A method for transplanting donor tissue into a brain, comprising:

providing a first cannula including an open elongated tube having a distal end adapted to penetrate brain tissue;

penetrating a brain with the first cannula to a predetermined depth to create a transplant site and fixing said first cannula in space relative to the brain;

providing an elongated second cannula having an outer diameter slightly smaller than the inner diameter of said first cannula, and a reducible volumetric portion;

filling said reducible volumetric portion of the second can-

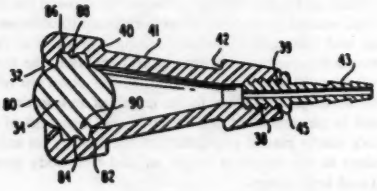
nula with a predetermined quantity of donor tissue to be transplanted;
placing the second cannula within the first cannula such that said reducible volumetric portion of the second cannula is located in the vicinity of the transplant site:
fixing said second cannula against movement away from said transplant site;
axially withdrawing said first cannula in a direction away from said transplant site and along said second cannula; and
depositing said donor tissue in said brain at said transplant site, and axially withdrawing said second cannula.

5,004,458

IMPLANTABLE DEVICE

Edward J. Sampson, Carlisle, Mass., assignor to Shiley Infusaid, Inc., Norwood, Mass.

Continuation-in-part of Ser. No. 242,445, Sep. 9, 1988, abandoned, which is a continuation-in-part of Ser. No. 89,113, Aug. 25, 1987, abandoned. This application Jan. 24, 1990, Ser. No. 469,895
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—175 **20 Claims**



1. A body implantable access device comprising: a cylindrical hollow port, said part having an inlet an internal cavity and an outlet, a self sealing septum disposed in and covering said inlet said septum having a shaped target face and positioned in said port at substantially a right angle to said outlet such that a needle puncturing said target face of said septum will be substantially in line with said outlet.

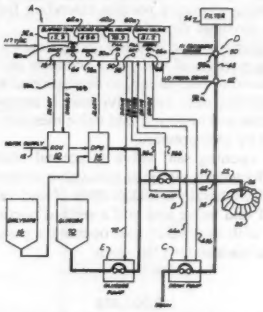
5,004,459

CONTINUOUS CYCLIC PERITONEAL DIALYSIS SYSTEM AND METHOD

Alan M. Peabody, 102 Meadow Creek Ct., Greer, S.C. 29651; Olin S. Anderson, Jr., 1216 Morven Rd., and Henry H. Morton, 100 Covington St., both of Wadesboro, N.C. 28170

Continuation-in-part of Ser. No. 858,645, May 2, 1986, Pat. No. 4,747,822, which is a continuation-in-part of Ser. No. 840,142, Mar. 17, 1986, Pat. No. 4,718,890, which is a continuation-in-part of Ser. No. 629,130, Jul. 9, 1984, Pat. No. 4,586,920. This application May 31, 1988, Ser. No. 200,624
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—29 **19 Claims**

1. A continuous cycle peritoneal dialysis process comprising:
providing a source of a generally continuous and unlimited supply of sterilized dialysis fluid;
providing an inflow line for connection to a catheter adapted for implantation into the peritoneal cavity of a patient;
providing an outflow line for connection to said catheter;
using pump means for pumping sterilized dialysis fluid from said source to said catheter through said inflow line during a fill cycle and for pumping said fluid from said catheter to a drain through said outflow line during a drain cycle;
monitoring a function of a volume of said sterile dialysis fluid in said peritoneal cavity by determining a high level signal for said dialysis fluid inflow corresponding to a comfortable and efficient cavity distension level of said patient, and setting a low level signal for said dialysis fluid outflow corresponding to a low volume level for dialysis; and controlling said pump means in response to said high level signal to pump a calibrated fill volume of fluid into said cavity and in response to said low level signal to pump a calibrated drain volume of fluid from said cavity continuously in alternating fill and drain cycles;
delivering said drain volume of fluid pumped out of said cavity to a disposal means so that a single pass of said dialysis fluid occurs through said peritoneal cavity of said patient during said fill and drain cycles;



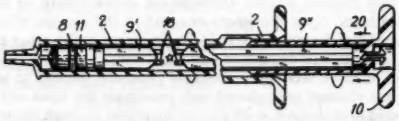
calibrating said fill volume and drain volume so that a prescribed amount of dialysis fluid is left in said abdominal cavity between said fill and drain cycles;
mixing glucose with said dialysis fluid prior to pumping said fluid into said cavity;
determining the amount of fluid removed from said peritoneal cavity of said patient; and
adjusting the amount of glucose mixed to vary the glucose concentrate of said fill volume fluid in response to amount of fluid removed from said patient.

5,004,460

NON-REUSABLE SYRINGE

Carlos V. Gimeno, Lorenzo Carbonell, 03003 Alicante, Spain

Filed Sep. 7, 1988, Ser. No. 241,382
Claims priority, application Spain, Jan. 7, 1988, 8800026
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—228 **13 Claims**



1. A single use self-destructible syringe having a barrel part defining a longitudinal axis and plunger part with a plunger stem having a rupture point, the plunger stem being adapted to move forward and backward relative to the barrel part, characterized in that the syringe comprises:
Means for turning said plunger part relative to said barrel part during forward motion of said plunger part defining the action of injecting;
Means for blocking the turning of one segment of the plunger stem on one side of the rupture point as the plunger part advances during the action of injecting so that sufficient torque is generated between said one segment and the remainder of the stem to break said stem at said rupture point at the end of the injecting action; and
Clutch means on one end of the plunger stem, for coupling said turning means to the plunger stem during the action of injecting and for uncoupling said turning means from

the plunger stem during the backward movement thereof so as to prevent turning of said plunger stem thereby to avoid breaking of the plunger stem at the rupture point during the loading of the syringe.

5,004,461

METHODS FOR RENDERING PLASTICS THROMBORESISTANT AND PRODUCT

Joseph E. Wilson, 9827 Brockbank, #136, Dallas, Tex. 75220

Filed Mar. 23, 1989, Ser. No. 327,686
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—265 8 Claims

1. A thromboresistant polymeric article for use in contact with blood or blood products, the polymeric article comprising:

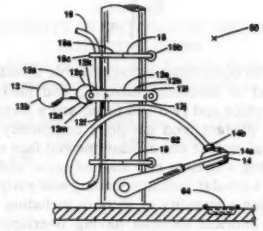
a polymeric body formed with at least one exposed surface for contacting blood or blood products, the polymeric body having bonded thereto an antithrombotic agent selected from the group consisting of 3-hydroxypyridine, 8-hydroxyquinoline, L-hydroxyproline, 2-(3,5-di-t-butyl-2-hydroxyphenyl)-5-chlorobenzotriazole, 1-hydroxybenzotriazole, and the compound which comprises an equiproportional mixture of dihydroergocornine methane sulfonate, dihydroergocristine methane sulfonate and α- and β-dihydroergocryptine methane sulfonate in the ratio of 1.5–2.5:1.0.

5,004,462

ADJUSTABLE WATER-LEVEL FLUSHING APPARATUS

Leo M. Mahler, 8 E. Gainsborough Rd., Thousand Oaks, Calif. 91360

Filed Mar. 5, 1990, Ser. No. 488,149
Int. Cl.[5] E03D *1/14*
U.S. Cl. 4—325 10 Claims



1. An adjustable water-level toilet flushing apparatus for use in a toilet water tank having a hollow flapper valve pivotally attached to an overflow tube and a drain with a valve seat, said apparatus comprising:

(a) a water-level release assembly adapted to be attached to the overflow tube at a level selected to effect a low-level flush, said assembly having first occluding means to occlude a hose, located between said assembly and the outer wall of the overflow tube, when the water level is above said assembly and conversely, to remove the occlusion the hose when the water level drops to the level of said assembly,

(b) a modified toilet flapper valve having an air vent hose bore on its upper surface,

(c) an air vent hose having an upper end, and a lower end that is inserted into and hermetically attached by an attachment means, to the air vent hose bore on said toilet flapper valve, where said hose is routed upwardly and through said first occluding means such that when the water level is above said assembly the hose is occluded to trap air and allow the toilet flapper valve to remain buoyant and conversely, when the water level drops to the level of said assembly, the occlusion is removed from the hose to allow said hose to vent at which time, the toilet flapper valve prematurely drops to seal the drain in the toilet water tank, and

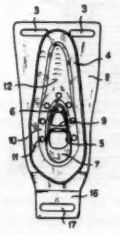
(d) means to selectively circumvent the low-level flush and allow a full-level flush by controlling the passage of air via second occluding means connected to the upper end of said air-vent hose such that when the upper end is occluded, the air trapped in said air vent hose maintains the toilet flapper valve buoyant and conversely, when the occlusion is removed, said hose is vented, and the toilet flapper valve drops to seal the drain in the toilet water tank.

5,004,463

PERMANENT RECEPTACLE FOR COLLECTING URINE FROM WOMEN

Pierre Nigay, Compiegne, France, assignor to Kilrush Limited, London, United Kingdom

PCT No. PCT/FR88/00530, § 371 Date Apr. 30, 1990, § 102(e) Date Apr. 30, 1990, PCT Pub. No. WO89/04156, PCT Pub. Date May 18, 1989
PCT Filed Oct. 28, 1988, Ser. No. 477,913
Claims priority, application France, Oct. 30, 1987, 87 15093
Int. Cl.[5] A61F *5/44;* A61B *5/00;* A47K *11/00*
U.S. Cl. 604—329 3 Claims



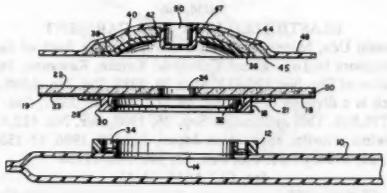
1. A permanent urine-collecting receptacle for women, of the type having a plate and a bevelled oblong duct for cooperating with the urethra, characterized in that the plate has a raised flexible lip (4) shaped so as to surround the female organs, said duct (5) being located in the interior zone of said lip and being surrounded by a channel (10) and, on one said only, by a dish (12), and the duct (5) and the channel (10) communicating with a collecting chamber (8) adjoining the plate, said receptacle being formed from a semi-flexible material.

5,004,464

CONVEX ADAPTER FOR OSTOMY DEVICE

Walter F. Leise, Jr., Yardley, Pa., assignor to E.R. Squibb & Sons, Princeton, N.J.

Filed Aug. 28, 1989, Ser. No. 399,613
Int. Cl.[5] A61F *5/44*
U.S. Cl. 604—338 25 Claims



1. An adapter for use with an ostomy device of the type including means having an adhesive coated body side for attaching a collection pouch to the body, the adapter comprising a member having a substantially convex surface and a layer

of adhesive which overlaps the edge of said member, said member being situated between said adhesive layer and said attaching means with said convex surface adjacent said adhesive layer exposing a substantial portion of said adhesive layer, at least a part of said exposed adhesive layer portion directly contacting said body side of said attaching means.

5,004,465

DISPOSABLE ABSORBENT ARTICLE

Ingela Ternström, Mölnlycke, and Mats Eriksson, Vastra Frölunda, both of Sweden, assignors to Molnlycke AB, Gothenburg, Sweden

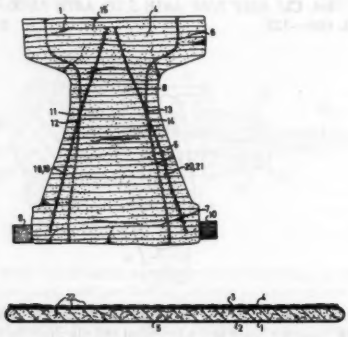
PCT No. PCT/SE87/00009, § 371 Date Jun. 21, 1989, § 102(e) Date Jun. 21, 1989, PCT Pub. No. WO88/05269, PCT Pub. Date Jul. 28, 1988

PCT Filed Jan. 18, 1988, Ser. No. 377,856

Claims priority, application Sweden, Jan. 19, 1987, 8700179

Int. Cl.[5] A61F *13/16*

U.S. Cl. 604—385.1 **9 Claims**



1. In a disposable absorbent article such as a diaper, a sanitary napkin, an incontinence protection garment, a wound dressing or the like comprising a liquid impermeable surface layer (2) and a liquid permeable surface layer (4) encasing an absorbent core (5) therebetween, and having elastic members (11–14) applied thereto; the improvement wherein the liquid permeable layer (4) is composed of at least two separate webs (3,4), said at least two webs (3,4) being joined together by means of a bonding pattern constituted by substantially parallel bonding lines at least crossing the elastic members (11–14) in order to cooperate with these members, whereby the liquid permeable surface layer (4) on its side turn away from the absorbent core (5) has air-filled channels and a soft, wavy surface.

5,004,466

ELASTICIZED UNIT AND GARMENT

Masashi Uda, Minoo, and Jun Oohira, Kagawa, both of Japan, assignors to Toyo Elizai Kabushiki Kaisha, Kawanoe, Japan

Division of Ser. No. 196,612, May 20, 1988, Pat. No. 4,908,089, which is a division of Ser. No. 68,222, Jun. 30, 1987, Pat. No. 4,776,911. This application Sep. 25, 1989, Ser. No. 412,126

Claims priority, application Japan, Jun. 30, 1986, 61-153660; Nov. 11, 1986, 61-269423; Feb. 13, 1987, 62-31958

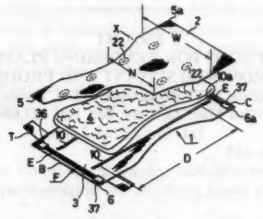
Int. Cl.[5] A61F *13/15*

U.S. Cl. 604—385.2 **5 Claims**

1. A garment for providing a sealed tight fit with the skin of a wearer, the garment comprising:

a base fabric material; and

at least one elasticized fabric unit comprising a pair of tape members and a plurality of elastic strands fixed to the tape members,



the elasticized fabric unit being fixed to the base material with the elastic strands being in a stretched state.

5,004,467

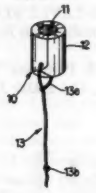
TAMPON

Alfred Hinzmann, Weems; Timour T. Shu; Wojciech S. Drewnowski, both of Richmond, and Peter M. Preisner, Quinton, all of Va., assignors to Hauni Richmond, Inc., Richmond, Va.

Filed Oct. 4, 1989, Ser. No. 416,997

Int. Cl.[5] A61F *13/15*

U.S. Cl. 604—904 **7 Claims**



1. A tampon comprising a compressible substantially cylindrical pledget of absorbent material, said pledget having a peripheral surface and two end faces; and a foraminous envelope for the pledget, said envelope completely surrounding said peripheral surface and at least one end face of the pledget and comprising a bottom end wall adjacent said at least one end face and a tubular wall surrounding said peripheral surface and comprising a plurality of sections including two substantially semicylindrical sections having overlapping marginal portions extending from said at least one end face at least to the other of said end faces.

5,004,468

SKIN GRAFT PREPARATION APPARATUS

Robert W. Atkinson, Dover, Ohio, assignor to Zimmer, Warsaw, Ind.

Filed Jul. 3, 1989, Ser. No. 374,833

Int. Cl.[5] A61B *17/322*

U.S. Cl. 606—132 **17 Claims**

1. A skin graft preparation apparatus, comprising:

(a) a housing;

(b) support means on said housing for supporting roller means;

(c) roller means supported on said support means and comprising a guide roller and a cutting roller;

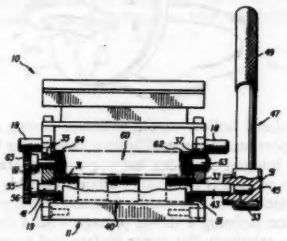
(d) openable cover means on said support means for allowing, in an open position thereof, removal and replacement of said cutting roller;

(e) actuator means for said roller means including an actuator coupled to one of said rollers and drive means drivingly coupling said rollers together whereby rotations of one of said rollers result in rotations of another of said rollers;

(f) said guide roller including laterally adjacent cylindrical regions of differing diameters; and

(g) carrier means having a first face and a second face, said first face having a stepped surface and said second face being substantially flat whereby said carrier means has adjacent regions of differing thicknesses;

(h) said carrier means being insertable between said rollers with said first face facing said guide roller with at least one of said adjacent regions of said carrier means having a



greater thickness at least partially engaging an aligned one of said adjacent regions of said guide roller having a lesser diameter and with a piece of skin on said second face whereby movement of said actuator means in a prescribed direction results in movement of said carrier means in a direction of motion between said rollers and engagement of said cutting roller with said piece of skin to cut a desired pattern of cuts thereon;

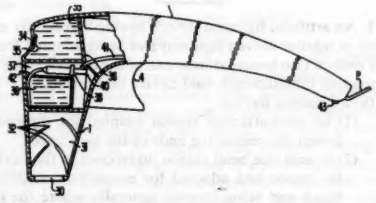
(i) said adjacent regions of said carrier means being elongated in said direction of motion.

5,004,469

IMPROVEMENTS IN AUTOMATIC MECHANICAL SUTURING GUNS

Beniamino Palmieri, Modena, and Rodolfo Garlati, Olginate, both of Italy, assignors to Ricerche Biomediche S.r.l., Milan, Italy

Filed Mar. 7, 1989, Ser. No. 319,686
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—139 **12 Claims**



1. Automatic mechanical suturing gun having a gun body and in which a trigger is provided to allow a surgeon to cause delivery and application of suture stitches through an outlet of the gun body to a wound, comprising:

clamping means for clamping together the margins of the wound, said clamping means being arranged adjacent the outlet;

control means, mounted externally of the gun body in a position easily accessible to the surgeon, for actuating said clamping means;

driving means for transmitting movement of said control means to said clamping means;

housing means for containing and retaining gauze tampons;

first dispensing means for containing and dispensing a disinfectant liquid; and

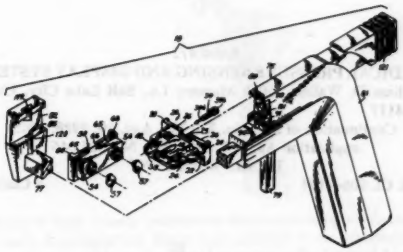
second dispensing means for containing and dispensing a suture adhesive.

5,004,470

EARPIERCING CARTRIDGE ASSEMBLY

Samuel J. Mann, Englewood, N.J., assignor to Inverness Corporation, Fair Lawn, N.J.

Continuation of Ser. No. 471,689, Jan. 29, 1990, abandoned, which is a continuation of Ser. No. 193,472, May 13, 1988, abandoned. This application Jun. 21, 1990, Ser. No. 541,454
Int. Cl.[5] A61B *17/34*
U.S. Cl. 606—188 **14 Claims**



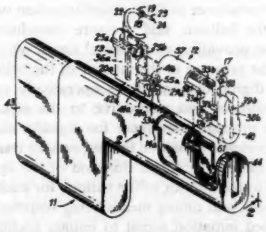
1. An earpiercing cartridge assembly for piercing an ear comprising: a first and second earring stud and stud cartridge means for releasably supporting both of said earring studs; first and second clutches and a clutch cartridge means for releasably supporting both of said earring clutches; earpiercing instrument means including a push rod, for slideably supporting and positioning said stud cartridge means with respect to said push rod, said stud cartridge means including positioning means associated therewith and cooperating with said earpiercing instrument means so that said stud cartridge means is slideably displaceable relative to said earpiercing instrument means, without requiring removal from said earpiercing instrument means so that each of said first and second earring studs is adapted to be selectively slideably displaced into coaxial alignment with said push rod.

5,004,471

STERILE EAR PIERCING ASSEMBLY

Samuel J. Mann, Englewood, N.J., assignor to Inverness Corporation, Fair Lawn, N.J.

Filed Feb. 8, 1990, Ser. No. 477,081
Int. Cl.[5] A61B *17/34*; A44C *7/0*
U.S. Cl. 606—188 **12 Claims**



1. An ear piercing assembly comprising in combination:

an abstractly-shaped piercing earring including a piercing pin and an ornamental head which is asymmetrically oriented around the axis of the piercing pin and from which the piercing pin projects;

a cartridge adapted to receive said piercing earring and substantially envelope said piercing earring, said cartridge including clamping means for supporting and positioning said piercing earring in said cartridge; and

a housing means for receiving and guiding said cartridge and permitting said cartridge to be stored in a position which is substantially retained in said housing and is displaceable from said housing, said housing including camming means for engaging said clamping means when said cartridge is partially displaced from said housing and displacing said clamping means from said piercing earring so that said piercing earring is released from said cartridge as the piercing is completed.

5,004,472

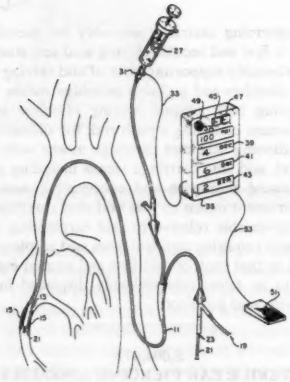
MEDICAL PRESSURE SENSING AND DISPLAY SYSTEM

William D. Wallace, 5038 Memory La., Salt Lake City, Utah 84117

Continuation of Ser. No. 230,783, Aug. 10, 1988. This application Aug. 13, 1990, Ser. No. 566,046

Int. Cl.[5] A61M *29/02*

U.S. Cl. 606—194 **8 Claims**



1. A system for measuring fluid pressure in a balloon of a catheter, said balloon being adapted for inflation inside a vessel in a human body, said catheter having an inflation lumen providing a fluid path between the interior of the balloon and an external source of fluid for inflating the balloon, said system comprising:

a pressure transducer in fluid communication with the interior of the balloon, said pressure transducer including means for providing an electrical signal which is a function of the pressure in the interior of the balloon;

electronic digital display means operatively connected to said transducer and responsive to the electrical signal from the pressure transducer for digitally displaying the balloon pressure measured by the pressure transducer; and

means for timing the actual duration of the application of pressure to the interior of the balloon for each inflation of the balloon, said timing means being responsive to a predetermined initiation signal to initiate timing, said electronic digital display means including means operatively connected to and responsive to the timing means for digitally displaying the actual duration of the application of pressure to the interior of the balloon for each inflation of the balloon.

5,004,473

SIMULATED NIPPLE FOR INFANTS

S. Javad Kalantar, Okemos, Mich., assignor to Phyb U.S.A., Inc., Lansing, Mich.

Filed May 11, 1989, Ser. No. 350,632

Int. Cl.[5] A61J *17/00*

U.S. Cl. 606—234 **9 Claims**

1. A simulated hollow nipple structure having an integral hollow tip portion, an integral hollow connecting throat portion and an integral expanded based portion characterized in that said tip portion is relatively bulbous, defining a terminal reservoir which opens rearwardly into said throat portion, said throat portion defining a throat passage with a cross section defined by a relatively flat upper surface and a concavo-convex undersurface externally arched forming an elongate inverted trench extending longitudinally of said nipple structure and in depression of said throat passage.

5,004,474

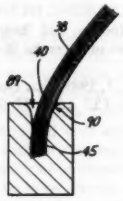
PROSTHETIC ANTERIOR CRUCIATE LIGAMENT DESIGN

David M. Fronk, Lake Forest, Calif.; David S. Brookstein, Wellesley, and John Skelton, Sharon, both of Mass., assignors to Baxter International Inc., Deerfield, Ill.

Filed Nov. 28, 1989, Ser. No. 442,093

Int. Cl.[5] A61F *2/08*

U.S. Cl. 623—13 **83 Claims**



1. An artificial ligament device having a generally multilayered or tubular woven ligament and being adapted for joining the ends of two bones, at least one of the bones having a tunnel extending therethrough, said device comprising:

(a) a ligament having

(1) an intra-articular region adapted for disposition between the respective ends of the two bones;

(2) at least one bend region juxtaposed to the intra-articular region and adapted for encasement within a bone block and being located generally where the ligament exits and runs within the bone block; and

(3) at least one end region juxtaposed to the bend region and adapted for fixed encasement within the bone block;

a plurality of warp yarns extending at least through the bend region; and

a fill yarn woven through the warp yarns in a density dependent upon the number of picks per inch in the weave; and

a pick density in the bend region being not greater than one-third the pick density in the intra-articular region; and

(b) at least one bone block adapted for insertion into the bone tunnel and having fixedly encased therein the end region

and a portion of the bend region, said bone block providing a permanent bend radius for the bend region at the point of exit from the bone block.

5,004,475

HIP PROSTHESIS

Dirk V. Vermeire, Pierrelaan 19, B-2160 Brecht, Belgium

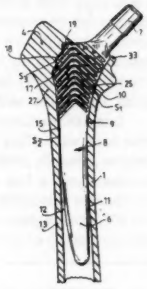
PCT No. PCT/BE89/00011, § 371 Date Jan. 12, 1990, § 102(e) Date Jan. 12, 1990, PCT Pub. No. WO89/08436, PCT Pub. Date Sep. 21, 1989

PCT Filed Mar. 15, 1989, Ser. No. 445,854

Claims priority, application Belgium, Mar. 15, 1988, 8800297

Int. Cl.[5] A61F *2/36*

U.S. Cl. 623—23 **18 Claims**



1. Stem for a hip prosthesis having a femur end to be received in the femur and a head end for connection to a hip head, which stem is provided for medial support on the pubic arch (S_1) with a curved, smooth medial stem support part, is provided for lateral support on the lateral cortex (S_2) with a lateral stem support part, and is provided for lateral support on the greater trochanter (S_3) with a lateral comb-like stem support part located between the lateral stem support part and the head end and comprising a number of combs, the comb connecting onto the lateral side protruding laterally relative thereto, and which stem is provided on the ventral and dorsal side at the point of the metaphysial portion with at least one groove which consists of groove portions converging in the direction of the head end and enclosing an apex.

5,004,476

POROUS COATED TOTAL HIP REPLACEMENT SYSTEM

Stephen D. Cook, New Orleans, La., assignor to Tulane University, New Orleans, La.

Filed Oct. 31, 1989, Ser. No. 445,920

Int. Cl.[5] A61F *2/36*

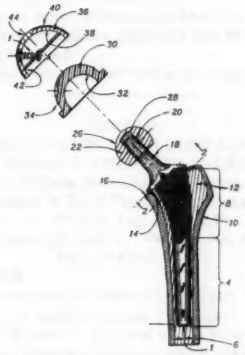
U.S. Cl. 623—23 **25 Claims**

1. A hip joint prosthesis comprising, in combination:

an inert metal alloy intramedullary stem having posterior, proximal anterior and distal anterior surfaces defined by respective confluent arcs which enable said stem to anatomically conform to the femoral canal, the stem having a medial collar adjacent an upper end of a proximal portion, the collar extending medially outwardly from the stem for engagement with the calcar region of the femur, said upper end terminating in a tapered shaft adapted to receive a femoral head component, the stem having a smooth distal portion with a lower end flattened to form an anterior stem tip to avoid impingement with the cortices, thereby preventing distal loading and consequent mid-thigh pain; a porous coating of metal beads providing a porous surface of interconnected three dimensional pores over the proximal portion of the stem and an underside of said medial collar, said coating adapted to mechanically interlock the proximal stem area with both soft cancellous and hard cortical bone tissue of the femur;

an inert metal alloy femoral head having a smooth substantially spherical outer bearing surface and adapted to be attached to the tapered shaft of the stem, intraoperatively;

an inert metal alloy acetabular cup for attachment to the acetabulum having a substantially hemispherical shape and inner and outer surfaces, with a porous coating of metal beads affixed to substantially all of said outer surface to thereby provide a porous surface of interconnected three dimensional pores, said inner surface being substantially smooth; and



an inert high density polymeric bearing having a substantially hemispherical shape and adapted to be attachably received within said cup and to receive the femoral head so as to permit said femoral head to articulate freely therein.

5,004,477

PROSTHESIS FOR LEG AMPUTATION AND A PROCESS FOR ITS MANUFACTURE

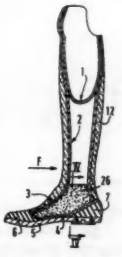
Michel Palfray, Seurre, France, assignor to Etablissements Proteor, France

Filed Oct. 20, 1989, Ser. No. 424,525

Claims priority, application France, Oct. 21, 1988, 88 13840

Int. Cl.[5] A61F *2/66, 2/60*

U.S. Cl. 623—53 **6 Claims**



1. A prosthesis for amputation of the leg, which comprises, in monobloc form;

a socket (1) of a thermosettable resin;

a hollow leg element (2) rigidly integral with the socket, likewise of a thermosettable resin;

a hollow foot part (3) rigidly integral with the leg element (2), and in which is lodged a rigid core (26) of a foamed material, this foot part being likewise of a thermosettable material, wherein the core (26) of the hollow foot part comprises two corner-shaped parts (26*b*) of a flexible material, each with a ridge arranged essentially longitudinally along the foot part;

a sole element (4) of a thermosettable resin, closing the hollow foot part at its base; and

below the sole element (4), a heel corner (7), a metatarsus (6) and an actual elastomer sole (5).

5,004,478

MOTOR FUEL FOR INTERNAL COMBUSTION ENGINES

Hans-Henning Vogel, Frankenthal; Hans P. Rath, Gruenstadt; Claus P. Jakob, Viernheim, and Knut Oppenlaender, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 31, 1989, Ser. No. 429,814

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1988, 3838918

Int. Cl.[5] C10L *1/18*

U.S. Cl. 44—398 3 Claims

1. A motor fuel containing an amino or amido containing detergent and, as a fuel-detergent-enhancing additive in the form of a base oil, 50 to 5000 ppm of a mixture of:

(a) a polyether obtained by the reaction of (1) one mole of a starter selected from the group consisting of aliphatic and aromatic mono-, di- or poly- alcohols, amines, amides and alkylphenols and (2) at least about 8 moles of propylene oxide or butylene oxide and having a total molecular weight of not less than 500, and

(b) an ester of a carboxylic acid selected from the group consisting of adipic, phthalic, isophthalic, terephthalic and trimellitic acid and a long-chain alkanol or polyol, the ester having a minimum viscosity of 2 mm^2/s at 100° C. and a molecular weight from 370 to 1500 and wherein the weight ratio of (a) to (b) is from 20:80 to 80:20.

5,004,479

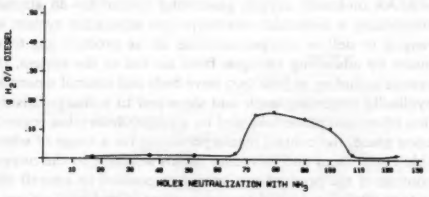
METHANOL AS COSURFACTANT FOR MICROEMULSIONS

Steven G. Schon, Philadelphia, and Edward A. Hazbun, Media, both of Pa., assignors to Arco Chemical Technology, Inc., Wilmington, Del.

Filed Jun. 9, 1986, Ser. No. 872,371

Int. Cl.[5] C10L *1/32*

U.S. Cl. 44—302 10 Claims



1. A microemulsion fuel composition consisting essentially of:

(a) at least 50% of weights of a petroleum hydrocarbon fuel;

(b) about 2.0 to about 40% by weight water; and

(c) a surface active amount of a surfactant consisting essentially of a combination of

(1) methanol and

(2) fatty acid partially neutralized to within 20 mol % of the optimum netralization value with a nitrogenous base selected from ammonia, (mono) ethanol amine or (mono) isopropanol amine; the weight ratio of partially neutralized fatty acid to methanol being in the range 0.5:1 to 8.0:1.

5,004,480

AIR POLLUTION REDUCTION

Diane D. Kanne, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed May 31, 1988, Ser. No. 200,757

Int. Cl.[5] C10L *1/18*

U.S. Cl. 44—387 48 Claims

1. A method for reducing the levels of air pollution resulting at least in part from the combustion of diesel fuel in diesel engines, said method comprising:

(a) deriving, in an oil refinery, a diesel fuel from a whole crude or a fraction thereof;

(b) then blending at least 10 volume percent of the diesel fuel produced per day from said refinery with dimethyl carbonate so as to provide a diesel fuel composition containing dimethyl carbonate in a concentration of at least about 0.5 volume percent, followed by;

(c) delivering a major portion of said blended fuel composition to storage facilities supplying fuel for use with said diesel engines; and

(d) combusting said blended fuel in said engines.

5,004,481

FUEL COMPOSITIONS CONTAINING SULFUR-BRIDGED PHENOLIC ANTIOXIDANTS

William Y. Lam, Ballwin, and Gregory P. Liesen, St. Louis, both of Mo., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 389,329, Aug. 3, 1989, Pat. No. 4,946,610.

This application May 4, 1990, Ser. No. 519,416

Int. Cl.[5] C10L *1/24*

U.S. Cl. 44—435 5 Claims

1. A fuel composition comprising a liquid fuel and from about 0.05 to 5.0 weight percent of a liquid, sulfur-bridged hindered phenol product prepared by the process comprising reacting a liquid mixture of phenols, which mixture contains at least two different hindered phenols each phenol having at least one hydrogen in the ortho or para position, with a sulfur chloride, in amounts of from about 0.45 to 0.55 mole of sulfur chloride per mole of phenol, in the presence of an amount of a nitrogen containing polar modifier which is effective to reduce the copper corrosion properties of said product and recovering the liquid, sulfur-bridged hindered phenol product.

5,004,482

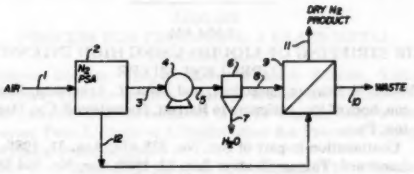
PRODUCTION OF DRY, HIGH PURITY NITROGEN

Oscar W. Haas, Cheektowaga; Ravi Prasad, East Amherst, and James Smolarek, Boston, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed May 12, 1989, Ser. No. 350,772

Int. Cl.[5] B01D *53/22, 53/04*

U.S. Cl. 55—16 21 Claims



1. An improved process for the production of dry, high purity nitrogen from air comprising:

(a) passing a wet, high purity nitrogen from a pressure swing adsorption system or wet feed air stream to a dryer membrane system capable of selectively permeating water from said wet stream;

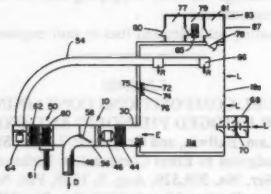
(b) passing relatively dry purge gas to the low pressure permeate side of said dryer membrane system to facilitate the carrying away of water vapor from the surface of the membrane and maintaining the driving force for removal of water vapor through the membrane from the high purity nitrogen or feed air stream for enhanced moisture removal therefrom, said relatively dry purge gas comprising waste gas from said pressure swing adsorption system or nitrogen product gas, whereby the provision of said purge gas on the permeate side of the dryer membrane system facilitates the desired moisture removal with minimum loss of product gas.

5,004,483

PARTICULATE ABATEMENT AND ENVIRONMENTAL CONTROL SYSTEM

Joe C. Eller; James E. Leavens, and Charles H. Wyatt, all of Houston, Tex., assignors to Enviro-Air Control Corporation, Houston, Tex.

Filed Apr. 25, 1990, Ser. No. 514,092
Int. Cl.[5] B01D *50/00*
U.S. Cl. 55—20 20 Claims



1. A method of providing an improved temporary working environment during removal of hazardous particulate material or during the encapsulation of the hazardous particulate material, the method comprising:

defining a working space substantially sealed from space exterior of the working space;

powering a portable air moving unit for exhausting air including hazardous particulate material from the defined working space to maintain a negative pressure within the working space with respect to the space external of the working space;

monitoring the level of negative pressure within the working space:

filtering the exhausted air to remove the hazardous particulate material;

discharging a minority portion of the exhausted air to the space exterior of the working space;

powering a portable conditioning unit to condition a majority portion of the exhausted air, the majority portion of the exhausted air being defined by the exhausted air less the discharged air;

returning the conditioned air to the working space; and

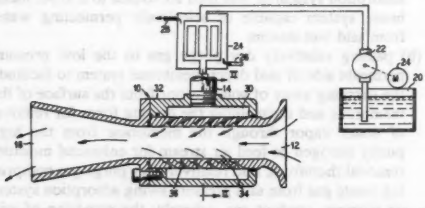
regulating the ratio of the minority portion of the discharged air to the majority portion of the conditioned air in response to the monitored level of negative pressure.

5,004,484

AIR STRIPPING OF LIQUIDS USING HIGH INTENSITY TURBULENT MIXER

Thomas E. Stirling, Sugarloaf, and John R. Ackerman, Hazleton, both of Pa., assignors to Barrett, Haentjens & Co., Hazleton, Pa.

Continuation-in-part of Ser. No. 238,474, Aug. 31, 1988, abandoned. This application Jun. 12, 1989, Ser. No. 364,588
Int. Cl.[5] B01D *19/00*
U.S. Cl. 55—53 19 Claims



10. A method for removing dissolved gases and volatile organic chemicals from a liquid comprising:

supplying a stream of pressurized liquid having contaminants therein to be removed to a contacting chamber having an inlet opening open to atmosphere and a discharge opening lying along an axis of said chamber; and

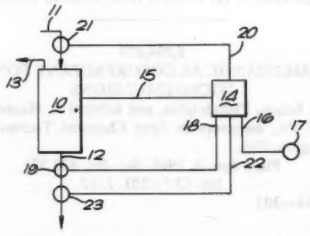
introducing said pressurized liquid through a plurality of passages having a length to diameter ratio of at least 10 to 1 open to said contacting chamber in the form of individual jets directed in an axial, angled direction perpendicular to the axis to form large surface areas in the liquid phase and turbulently mixing the liquid within said jets so as to cause air to be aspirated into said contacting chamber through said inlet opening in a manner to enhance a turbulent mixing of said air and liquid in said contacting chamber.

5,004,485

MOLECULAR SIEVE-TYPE GAS SEPARATION SYSTEMS

Humphrey A. S. Hamlin, Montacute, and Michael W. Harral, Yeovil, both of England, assignors to Normalair-Garrett (Holdings) Ltd., Yeovil, England

Filed Mar. 26, 1990, Ser. No. 498,393
Claims priority, application United Kingdom, Apr. 3, 1989, 8907447
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—160 12 Claims



1. An on-board oxygen generating system for an aircraft, comprising a molecular sieve-type gas separation system arranged to deliver oxygen-enriched air as product gas to an outlet by adsorbing nitrogen from air fed to the system, the system including at least two sieve beds and control means for cyclically subjecting each said sieve bed to a charge/adsorption on-stream phase followed by a purge/desorption regeneration phase, the control means providing for a range of selectable cycle times and including means sensitive to the oxygen content of the product gas, means responsive to aircraft altitude to display a desired oxygen content of said product gas at an altitude within an operating range, and comparator means for comparing the displayed desired oxygen content with the sensed oxygen content of the product gas and adapted to adjust the cycle time in the sense required to null the difference between said displayed and sensed oxygen contents of the product gas.

5,004,486

SUBMERGED-TYPE GAS CLEANING SYSTEM

Chun-Teh Chen, P.O. Box 55-1670, Taipei, Taiwan

Filed Jul. 2, 1990, Ser. No. 546,768
Int. Cl.[5] B01D *47/00*
U.S. Cl. 55—222 4 Claims

1. A submerged-type gas cleaning system comprising:

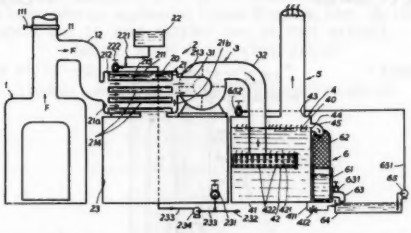
a combustion equipment producing flue gas when burned, having a by-pass gas duct branched from a main stack of the combustion equipment;

a cooling means connected to said by-pass gas duct of the combustion equipment for pre-cooling the flue gas passing therethrough;

an exhaust fan having an inlet duct connected to said cooling means and an outlet pipe;

a bubbling dust separating means for receiving a precooled flue gas from the outlet duct of the exhaust fan, having a bubbling dust separator submerged under a water level in a bubbling water tank for removing dust laden in the gas when bubbled through the bubbling dust separator;

a stack for discharging treated gas mounted on said bubbling water tank; and



a dust collection means for recovering dust, smoke or particulate matters separated from the water;

said bubbling dust separator including a closed hollow body drilled with a plurality of perforations in the hollow body communicated with the outlet duct of the exhaust fan for bubbling flue gas through the perforations for rubbing off dust, smoke or particulate matters therefrom.

5,004,487

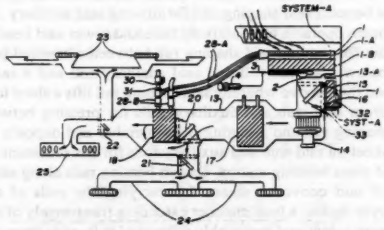
FILTER ASSEMBLY FOR PROTECTING MOTOR VEHICLE OCCUPANTS FROM POLLUTION

Thaddeus Kowalczyk, 8163 Lochdale, Dearborn Heights, Mich. 48127

Continuation-in-part of Ser. No. 337,943, Apr. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 239,386, Sep. 1, 1988, abandoned. This application Feb. 27, 1990, Ser. No. 485,230

Int. Cl.[5] B01D *46/12*

U.S. Cl. 55—269 **3 Claims**



1. In an air purification system for protecting motor vehicle occupants from pollution, the system adapted for a motor vehicle having a passenger compartment and a source of hot liquid for heating, and comprising:

a plenum in communication with the passenger compartment of the vehicle, the plenum having

a first air inlet adapted to receive outside air from outside the passenger compartment into said plenum,

a second air inlet adapted to receive inside air from said passenger compartment into said plenum, and

a blower operable to move air from said plenum into said passenger compartment,

a filter with at least one replaceable filter element, located in said plenum downstream of the air inlets, for removing pollutants from the outside and/or from the inside air,

door means located upstream of said filter and downstream of said air inlets, adapted to assume a plurality of positions in said plenum in blocking relationship to air being moved through said first air inlet and/or the second air inlet to selectively admit the outside air and/or the inside air to said blower, and

a hot liquid heater located upstream of said filter in the path of the outside air and adapted to raise the temperature of the outside air for protecting said filter from freezing and for keeping it dry, the heater having heat exchange means fort hot liquid from said hot liquid source.

5,004,488

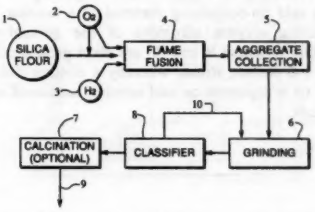
PROCESS FOR PRODUCING HIGH PURITY FUSED QUARTZ POWDER

Vikram P. Mehrotra, and Ray E. Barker, both of Terre Haute, Ind., assignors to Pitman-Moore, Inc., Lake Forest, Ill.

Filed Mar. 20, 1989, Ser. No. 331,692

Int. Cl.[5] C03B *20/00*

U.S. Cl. 65—18.2 **11 Claims**



1. A process for converting low density silica flour particles into high density fused silica particles of high purity, said process comprising:

feeding silica flour particles to a heating zone;

heating said silica flour particles in a flame to a temperature sufficient to form fused silica particles from said silica flour particles, said fused silica particles having a relatively higher bulk density than said silica flour particles;

controlling the flame temperature and the residence time of said silica flour particles in said flame to collect aggregates of said fused silica particles which exhibit a honeycomb-shaped structure that is surface bonded and less than 25% coalesced to facilitate a subsequent grinding step;

grinding said aggregates into ground fused silica particles.

5,004,489

PROCESS FOR PRODUCING A GLASS-METAL CONNECTION

Frédéric Rotman, Tokyo, Japan; Yannick Rancon, Velizy, France; Philippe Queille, Viroflay, France, and Michel Olivier, Beynes, France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France

Filed Feb. 22, 1990, Ser. No. 483,177

Claims priority, application France, Feb. 22, 1989, 89 02277

Int. Cl.[5] C03C *27/02*

U.S. Cl. 65—32.2 **11 Claims**

1. A method of bonding together a glass part and a metal alloy part, said metal alloy part comprising iron and nickel, comprising the following successive steps:

subjecting said glass part and said metal alloy part to an oxidation phase under a first atmosphere which is substantially inert and contains from 2 to 8% of water vapor and less than 1% of hydrogen at a first temperature of from 600° to 800° C.;

bonding said glass part and said metal alloy part together under a second atmosphere at a second temperature greater than the first temperature,

wherein at least said first atmosphere is obtained by a catalytic reaction of a mixture of hydrogen and oxygen in proportions selected so as to obtain the desired content of water vapor and hydrogen.

5,004,490

METHOD OF MAKING GLASS SUBSTRATE COATED WITH TIN OXIDE

Franklin I. Brown, Riverview, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 10, 1987, Ser. No. 83,479
Int. Cl.[5] C03C 25/02
U.S. Cl. 60—60.52 7 Claims

1. In a method of applying a tin oxide coating to a selected surface of a glass substrate in which said selected surface of said glass substrate is heated to a temperature sufficiently hot so that a heat decomposable tin-containing material coming into the vicinity of said selected surface will be heat decomposed permitting said tin contained in said tin-containing material to be oxidized and deposited as tin oxide on said selected surface, and in which a tin-containing material is applied in an oxygen containing ambient to said heated selected surface of said glass substrate, the improvement comprising:

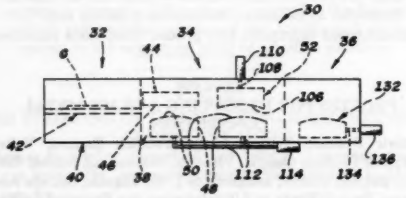
forming said tin-containing material of a coating material containing alkyltin alkoxides of the general formula $RSn(OR^1)_3$ where R and R^1 are alkyl groups containing from 1–6 carbon atoms, whereby a coating film of oxidized tin is deposited on said selected surface of said glass substrate.

5,004,491

GLASS SHEET FORMING METHOD AND APPARATUS UTILIZING LOWER FULL SURFACE VACUUM MOLD AND UPPER RING MOLD

Ronald A. McMaster, Perrysburg, and Donivan M. Shetterly, Toledo, both of Ohio, assignors to Glasstech, Inc., Perrysburg, Ohio

Filed May 22, 1990, Ser. No. 527,144
Int. Cl.[5] C03B 23/03
U.S. Cl. 65—106 21 Claims



1. Apparatus for forming a flat glass sheet, comprising:

a heating conveyor for heating the flat glass sheet to a sufficiently high temperature to permit forming thereof;

an upper topside transfer device having a downwardly facing flat surface for receiving the heated flat glass sheet from the heating conveyor;

a lower vacuum mold having an upwardly facing full surface with at least a portion thereof having an upwardly convex shape for receiving the heated flat glass sheet from the downwardly facing flat surface of the topside transfer device; and

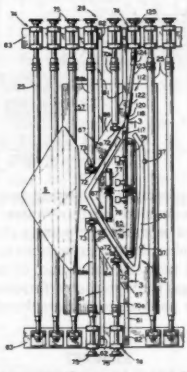
an upper ring mold for forming and sealing the periphery of the heated glass sheet against the surface of the lower vacuum mold at which a vacuum is drawn within the sealed periphery of the glass sheet to fully form the glass sheet to the shape of the vacuum mold surface, and the upper ring mold including an enclosure defining a chamber in which a vacuum is drawn to permit the upper ring mold to lift the formed glass sheet upwardly from the lower vacuum mold after the vacuum actuated forming.

5,004,492

GLASS SHEET CONVEYING AND BENDING APPARATUS

John W. Borer, Toledo; William J. Skilliter, Genoa, both of Ohio, and Lowell J. Conner, Lathrop, Calif., assignors to Libbey-Owens-Ford Co., Toledo, Ohio

Filed Aug. 29, 1989, Ser. No. 400,465
Int. Cl.[5] C03B 23/03
U.S. Cl. 65—289 17 Claims



1. Apparatus for press bending heat-softened glass sheets comprising a conveyor means having rolls for moving a sheet to be bent along a predetermined, generally horizontal to a press bending station, said press bending station including a vertically movable bending member having a continuous peripheral shaping rail conforming to the marginal outline of the glass sheet to be bent, at least one stub roll extending transversely of said conveyor means outside said shaping rail and having an inner end adjacent said shaping rail, at least one auxiliary roll independent from said stub roll and disposed entirely within the outline of said peripheral shaping rail, means beneath said shaping rail for driving said auxiliary roll, and means operable to selectively raise and lower said bending member for moving said shaping rail between a lowered position below said stub roll and said auxiliary roll and a raised position thereabove whereby said shaping rail lifts a sheet to be bent from said stub and auxiliary rolls for pressing between said shaping rail and a mating press member and deposits the bent sheet on said stub and auxiliary rolls for advancement out of said press bending station, spaced bearing rails along either side of said conveyor means for carrying the rolls of said conveyor means, a base member extending transversely of said conveyor means and removably supported at its ends upon said bearing rails, and means mounting said at least one auxiliary roll upon said base member.

5,004,493

METHOD FOR INDUCING RESISTANCE IN PLANTS USING ENVIRONMENTALLY SAFE ANTIOXIDANTS

Dale M. Norris, 101 S. Rock Rd., Madison, Wis. 53705

Filed Jun. 10, 1988, Ser. No. 205,157
Int. Cl.[5] A01N 43/08, 43/16
U.S. Cl. 71—88 15 Claims

1. A method for increasing the resistance of a plant to pests or pathogens comprising the steps of administering to the surface of said plant an amount of one or more environmentally safe antioxidants effective to induce said resistance, said antioxidants being selected from the group consisting of ascorbates and tocopherols.

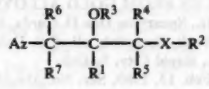
5,004,494

HETEROCYCLIC COMPOUNDS

Balasubramanyan Sugavanam; Paul A. Worthington, both of Berkshire, and John M. Clough, Buckinghamshire, all of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 7,352, Jan. 27, 1987, abandoned, which is a continuation of Ser. No. 353,941, Mar. 2, 1982, abandoned. This application Jan. 18, 1989, Ser. No. 298,835
Claims priority, application United Kingdom, Mar. 18, 1981, 8108412; Oct. 16, 1981, 8131301; Oct. 29, 1981, 8132682
Int. Cl.[5] A01N *43/653;* C07D *249/08*
U.S. Cl. 71—92 7 Claims

1. Triazole compounds having the general formula (I):



(I)

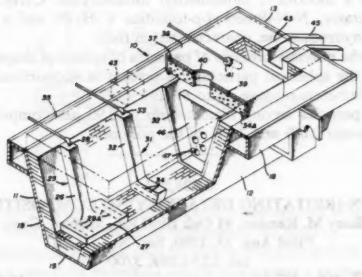
wherein R^1 is halophenyl and R^2 is hydrogen, C_1–C_6 alkyl or phenyl substituted with halogen R^3 is hydrogen; R^4 is hydrogen and R^5 is or C_1–C_6 alkyl; R^6 and R^7 are hydrogen; X is SO or SO_2; and Az is a 1,2,4- or 1,3,4-triazole ring; and isomers, acid addition salts and metal complexes thereof.

5,004,495

METHOD FOR PRODUCING ULTRA CLEAN STEEL

Micheal D. Labate, 115 Hazen Ave., Ellwood City, Pa.

Filed Feb. 5, 1990, Ser. No. 475,341
Int. Cl.[5] C21B *3/04, 7/072*
U.S. Cl. 75—10.22 12 Claims



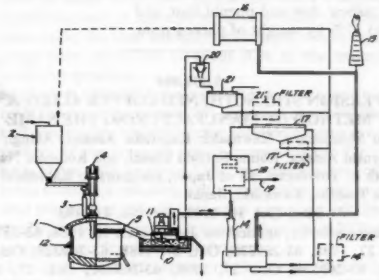
1. A process of treating molten steel to remove inoluble nonmetallic inclusions to produce clean and ultra clean steel comprising the steps of pouring molten steel into an insulated tundish having an insulated cover, maintaining a neutral atmosphere in said covered insulated tundish, stirring the molten steel with inert gas within said insulated covered tundish so as to precipitate said insoluble nonmetallic inclusions and moving same to the surface of the molten steel, maintaining and increasing molten steel temperature in said covered tundish, directing the insoluble nonmetallic inclusions from the tundish, pouring clean and ultra clean steel from the insulated tundish.

5,004,496

METHOD AND APPARATUS FOR TREATMENT OF DUST RECOVERED FROM OFF GASES IN METALLURGICAL PROCESSES

Jan A. Aune, Langhus, and Thor Pedersen, Oslo, both of Norway, assignors to Elkem a/s, Norway

Division of Ser. No. 209,492, Jun. 20, 1988, Pat. No. 4,957,551, which is a continuation-in-part of Ser. No. 40,307, Apr. 20, 1987, abandoned. This application Jul. 20, 1990, Ser. No. 555,653
Claims priority, application Norway, Apr. 2, 1987, 871369
Int. Cl.[5] C22B *7/02;* F27D *17/00*
U.S. Cl. 75—10.28 17 Claims



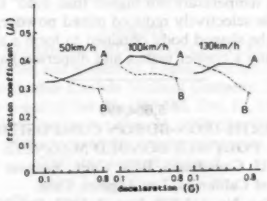
1. A method for treatment of dust precipitated from waste gas of a metallurgical process comprising the following steps:
(a) smelting said dust in combination with a reducing agent and a flux in a gastight electrothermic smelting furnace to produce an inert slag phase, a metal phase and a gas phase;
(b) tapping said furnace to remove said inert slag phase and said metal phase;
(c) oxidizing said gas phase in an afterburner;
(d) cooling the oxidized gas phase, and
(e) removing any unreacted dust from said cooled, oxidized gas phase.

5,004,497

FRICTION MATERIAL

Katsuhiro Shibata; Yuichi Azuma, and Tsuguya Suzuki, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 12, 1989, Ser. No. 406,394
Claims priority, application Japan, Sep. 12, 1988, 63-228079
Int. Cl.[5] B22F *1/00*
U.S. Cl. 75—229 8 Claims



5. A friction material, comprising:
0.85 to 30% by weight of carbon fibers; and
2 to 20% by weight of para-aramid fibers including fibrillar fibers;
AF < 1.67 CF where AF is the aramid fiber content by weight and CF is the carbon content by weight.

8. A friction material according to claim 5, further comprising:
10 to 50% by weight of at least one substance selected from

the group consisting of copper, nickel, copper-zinc alloy, iron and copper-tin alloy;

5 to 20% by weight of at least one substance selected from the group consisting of graphite, molybdenum disulfide, zinc sulfide, lead sulfide, antimony trisulfide, mica and boron nitride;

10 to 50% by weight of a combination of at least one substance selected from the group consisting of silicon dioxide, alumina, mulite, magnesia (MgO), zirconium oxide and Spinel-structered ferrite (Fe_3O_4) and at least one substance selected from the group consisting of barium sulfate, calcium carbonate and cupric oxide;

3 to 20% by weight of at least one substance selected from the group consisting of melamine dust, polyimide dust, cashew dust and phenol dust; and

8 to 15% by weight of phenol resin.

5,004,498

DISPERSION STRENGTHENED COPPER ALLOY AND A METHOD OF MANUFACTURING THE SAME

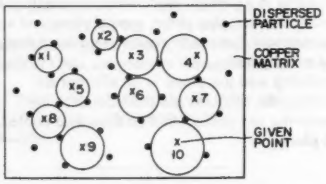
Keizo Shimamura, Kawasaki; Kagetaka Amano, Atsugi; Tatsuyoshi Aisaka, Ebina; Satoshi Hanai, and Kohsoku Nagata, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 10, 1989, Ser. No. 419,103

Claims priority, application Japan, Oct. 13, 1988, 63-257685; Oct. 27, 1988, 63-269328; Oct. 27, 1988, 63-269329; Oct. 27, 1988, 63-269330; Oct. 27, 1988, 63-269331; Oct. 27, 1988, 63-269333

Int. Cl.[5] **C22C** *29/12*

U.S. Cl. 75—233 **15 Claims**



9. A dispersion strengthened copper alloy produced by a method comprising the following steps:

mechanically pulverizing and mixing a powder of copper oxide having particle diameters of 5 μμm or less, and a raw material having particle diameters of 1 μμm or less which is chemically more stable than the copper oxide in a reducing atmosphere, to yield a mixed powder having particle diameters of 0.05 μμm or less;

selectively reducing the copper oxide contained in the resulting mixed powder, while maintaining said mixed powder at a temperature not higher than 1065° C.;

shaping the selectively reduced mixed powder; and

sintering the shaped body obtained to form a sintered body containing a copper matrix and dispersed particles.

5,004,499

RARE EARTH-IRON-BORON COMPOSITIONS FOR POLYMER-BONDED MAGNETS

Mohammad H. Ghandehari, Brea, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 115,829, Nov. 2, 1987, Pat. No. 4,834,812. This application May 26, 1989, Ser. No. 358,275

The portion of the term of this patent subsequent to May 31, 2005, has been disclaimed.

Int. Cl.[5] **H01F** *1/053*

U.S. Cl. 75—254 **21 Claims**

1. A composition for preparing a permanent magnet, said composition prepared by a method comprising the steps of:

(a) mixing a particulate alloy, containing at least one rare earth metal, iron, and boron, with at least one particulate additive metal having a melting temperature less than about 800° C.

(b) compacting the mixture to form a shape,

(c) heating the compacted shape at a temperature in the range from about 700° C. to less than 850° C. to form a heat-treated compact composition having magnetic properties, and

(d) crushing said heat-treated compact composition obtained from step (c) to produce a heat-treated compact powder composition having grain sizes of diameter less than 25 microns.

5,004,500

CHLORINATION PROCESS FOR RECOVERING GOLD VALUES FROM GOLD ALLOYS

Wendell E. Dunn, Jr., Spearfish; Dan D. Carda, Rapid City, and Timothy A. Storbeck, Spearfish, all of S. Dak., assignors to Auric-Chlor, Inc., Rapid City, S. Dak.

Filed Feb. 13, 1989, Ser. No. 310,233

Int. Cl.[5] **C22B** *11/06*

U.S. Cl. 75—422 **11 Claims**

1. A process for purifying a gold alloy comprising:

(a) reacting the gold alloy with chlorine at a temperature less than about 700° C. to form a metallic gold/metal chloride mixture; and

(b) washing the metallic gold/metal chloride mixture sequentially with air agitated hydrochloric acid and water to remove metal chlorides other than silver chloride from the mixture.

5,004,501

TWO PHASE CEMENT MIXTURE, PARTICULARLY SUITABLE FOR OTHOPAEDICS

Giovanni Faccioli, Monzambano; Basilio M. De Bastiani, Montegrotto; Bruno Magnan, Verona, and Renzo Soffiatti, Nogara, all of Italy, assignors to Tecres Spa, Bussolengo, Italy

Filed May 16, 1989, Ser. No. 352,569

Claims priority, application Italy, Jun. 1, 1988, 84950 A/88

Int. Cl.[5] **C09K** *3/00;* **A61F** *5/04, 2/00;* **C08K** *3/00*

U.S. Cl. 106—35 **5 Claims**

1. A two phase cement mixture which is particularly suitable for orthopaedic uses, comprising a solid powder phase and a liquid phase, wherein the solid phase comprises a polymer, polymethyl methacrylate ($-(C_5H_8O_2)_n-$) and a catalyst, benzoyl peroxide ($C_{14}H_{10}O_4$), while the liquid phase comprises a monomer, monomethyl methacrylate $C_5H_8O_2$, an accelerator, N-N-dimethyl-p-toluidine $C_9H_{13}N$ and a stabilizer, hydroquinone, characterized in that:

(a) the polymer consists of particles of spherical shape only;

(b) the spherical particles are present in proportions with diameters ranging up to 87 μm; and

(c) particles having diameter up to 0.90 μm comprise between 0.6% and 2.0% of the polymer.

5,004,502

NON-IRRITATING DETACKIFYING COMPOSITION

Chaudhary M. Ramzan, 91 Oak Bluff Rd., Milford, Conn. 06460

Filed Aug. 23, 1990, Ser. No. 571,207

Int. Cl.[5] **C09K** *3/00*

U.S. Cl. 106—287.13 **10 Claims**

1. A detackifying composition which is highly effective, non-toxic and provides for the painless removal of adhesive bandages from the skin, such composition comprising:

A. between about 20% and 90% by weight/volume of a volatile, low viscosity silicone fluid,

B. between about 10% and 70% by weight/volume of a paraffinic solvent selected from the group consisting of normal paraffinic solvents and isoparaffinic solvents; and

C. between about 1% and 20% by weight/volume of an isobutylene butene copolymer wherein said isobutylene butene copolymer is further defined as comprising an

average molecular weight ranging between about 300 and 475 and a specific gravity ranging between 0.8 and 0.9 when measured by ASTM Standard D-1298 at 15.5° C.

5,004,503

DISTRIBUTION OF POWDER FOR MAKING COATED GLASS

Hideo Kawahara, Toyonaka; Nobuhiro Sakata, Nishinomiya, both of Japan; Jean-Claude Coulon, Mercurey, and Patrick Lovera, Chatenay Malabry, both of France, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Aug. 2, 1983, Ser. No. 519,710
Claims priority, application Japan, Aug. 2, 1982, 57-134859
Int. Cl.[5] C09K *3/00*; B32B *17/06*
U.S. Cl. 106—287.18 8 Claims

1. A powder mixture for coating glass with homogenous coatings of uniform thickness which comprises:

(a) a composition which comprises dibutyltin oxide, dibutyltin difluoride, the acetylacetonates of Fe, Cr, Co, Ti, Al, Sn, Cu or In, or a mixture thereof, or other compound of the metals Fe, Cr, In, Co, Ti, Al, Sn and Cu or a mixture thereof, which are capable of being converted into a metal oxide or oxides upon contact with hot glass, and

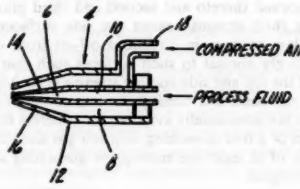
(b) a water-repellent, anhydrous product having a base of finely-divided silica, wherein the proportion of product (b) added is between about 0.5 to 5%, based on the total weight of the powder.

5,004,504

TRANSPARENT IRON OXIDE PIGMENTS

Rodney G. Schroeder, and Anand S. G. Sharangpani, both of Holland, Mich., assignors to BASF, N.J.

Filed Feb. 26, 1990, Ser. No. 485,025
Int. Cl.[5] C09C *1/22*
U.S. Cl. 106—456 13 Claims



1. A process for conversion of yellow transparent iron oxide to red transparent iron oxide comprising the steps of

atomizing an aqueous mass of yellow transparent iron oxide in a two fluid atomizing nozzle comprising a central conduit and an annular conduit surrounding said central conduit wherein said aqueous mass of yellow transparent iron oxide is passed through said central conduit and an atomizing fluid is forced under pressure through said annular conduit,

spraying the atomized pigment into a spray drying chamber wherein said atomized pigment is dried and calcined by heated air forming a plurality of minute discrete pigment particles and

recovering the minute discrete red pigment particles from the spray drying operation.

5,004,505

MAGNESIUM OXYCHLORIDE CEMENT COMPOSITIONS AND METHODS FOR MANUFACTURE AND USE

Russell I. Alley, and George E. Caine, both of Salt Lake City, Utah, assignors to CAC, Inc., Salt Lake City, Utah

Filed Nov. 4, 1988, Ser. No. 267,443
Int. Cl.[5] C04B *9/02*
U.S. Cl. 106—685 42 Claims

1. A composition for repairing damaged concrete surfaces produced by combining ingredients comprising:

a magnesium oxide composition having a weight percent of the concrete repair composition in the range from about 15% to about 30%, said magnesium oxide composition containing salt or mineral impurities other than magnesium oxide, the total amount of said impurities being in the range from about 5% to about 20% of the magnesium oxide composition;

a magnesium chloride brine solution having a specific gravity in the range from about 20° Baumé to about 30° Baumé, said magnesium chloride brine solution having a weight percent of the concrete repair composition in the range from about 15% to about 25%, said magnesium chloride brine solution containing salt or mineral impurities other than magnesium chloride, the total amount of said impurities being in the range from about 5% to about 20% of the magnesium chloride brine solution;

acid having a weight percent of the magnesium chloride solution in the range from about 1% to about 10%; and

a combination of different sized aggregate particles selected to minimize voids and interstitial spaces between said aggregate particles thereby forming a dense concrete repair composition, wherein the ratio of magnesium oxide to aggregate particles is in the range from about 1:2 to about 1:5.

5,004,506

WELAN GUM IN CEMENT COMPOSITIONS

Floyd L. Allen, Escondido; Glen H. Best, San Diego, and Thomas A. Lindroth, Spring Valley, all of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 366,063, Jun. 14, 1989, Pat. No. 4,963,668, which is a continuation of Ser. No. 181,844, Apr. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 47,748, May 7, 1987, abandoned. This application Apr. 2, 1990, Ser. No. 502,974
Int. Cl.[5] C08B *37/00*; E21B *33/00*
U.S. Cl. 106—729 10 Claims

1. A hydraulic cement composition comprising dry cement and 0.01–0.9% (wt) welan gum, based on the weight of the dry cement, whereby a cement slurry made therefrom is an improved suspension.

5,004,507

AQUEOUS-ALCOHOL FRUCTOSE CRYSTALLIZATION

Thomas P. Binder, and Robert M. Logan, both of Clinton, Iowa, assignors to Archer Daniels Midland Company, Decatur, Ill.

Continuation-in-part of Ser. No. 283,188, Dec. 12, 1988, Pat. No. 4,895,601. This application Oct. 31, 1989, Ser. No. 429,757
The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.
Int. Cl.[5] C13F *1/02, 1/04*
U.S. Cl. 127—58 24 Claims

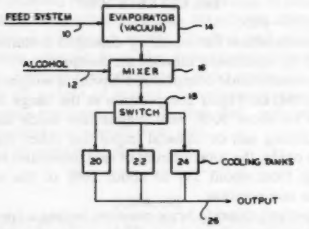
1. A continuous process for crystallizing fructose comprising the steps of:

(a) supplying an unseeded incoming aqueous fructose feed stream at a temperature in the order of about 130°–180° F.;

(b) placing said feed stream in an evaporator having an internal temperature in the range of about 105°–130° F.;

(c) continuing an evaporation within said evaporator until there is a crystallization of about 5–40% w/w of the total dry solids of fructose in said feed stream;

(d) discharging the partially crystallized magma content of said evaporator into a mixer and adding alcohol to said mixer with a mixture ratio in the range of from about 3 to 1 by weight to about 1 to 3 by weight of alcohol to said partially crystallized fructose feed stream;



(e) discharging the mixture from said mixer into at least one holding tank;

(f) cooling said mixture in said holding tank over a period of approximately 10–24 hours to a final temperature in the range of about 60°–80° F.; and

(g) removing and drying the contents of said holding tank.

5,004,508

THERMALLY DISSIPATED SOLDERING FLUX

Everitt W. Mace, Hutto; Janet Sickler, Georgetown, and Varadarajan Srinivasan, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 12, 1989, Ser. No. 449,647
Int. Cl.[5] B23K *34/35*
U.S. Cl. 148—22 **13 Claims**

1. A thermally dissipated no clean soldering flux adapted for use in assembling chips to integrated circuit boards where the stand off height of the chips to the boards is on the order of about 0.002 inches to 0.004 inches, the flux comprising:

from about 10 to about 20% by weight of camphor as a flux base;

from about 1 to 5% by weight of an organic activator;

the remainder being substantially at least one organic diluent; and

wherein the flux is characterized by the absence of halogen and rosin components and is thermally dissipated, in use, leaving no visible residue which would require a post cleaning step.

5,004,509

LOW RESIDUE SOLDERING FLUX

Samuel V. Bristol, Kokomo, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed May 4, 1990, Ser. No. 519,076
Int. Cl.[5] B23K *35/34*
U.S. Cl. 148—23 **44 Claims**

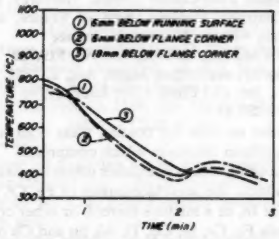
1. Low residue soldering flux comprising rosin and an activating amount of an essentially non-subliming dibasic acid mixture containing by weight about 15–30% succinic acid, 40–63% glutaric acid and 10–30% adipic acid.

5,004,510

PROCESS FOR MANUFACTURING HIGH STRENGTH RAILROAD RAILS

Meng W. Yu; Shihuai Su; Yue Z. Chen, all of Panzhihua; Zheng, Ticheng, Chongqing; Kebin Ji, Panzhihua; Shou R. Ling, Panzhihua; Jian C. Lin, Panzhihua; Jianhui Deng, Panzhihua, and Kunwu Zhang, Panzhihua, all of China, assignors to PanZhiHua Iron & Steel Co., Sichuan Province, China

Filed Jan. 30, 1989, Ser. No. 302,907
Int. Cl.[5] C21D *9/04*
U.S. Cl. 148—146 **15 Claims**



1. A method of treating in a heat treating zone a steel rail comprising a base connected by a web to a rail head having a top providing a running surface, a pair of lower jaws comprising bottom surfaces of the rail head, and two rail head side surfaces extending substantially normal to the top surface and defining with the top surface and the lower jaws, a pair of generally rounder upper rail head corners and a pair of generally rounded lower rail head corners, said method comprising, in the following order the steps of:

(a) inductively preheating the entire rail from a starting temperature in the range from ambient temperature to below about 500° C. to a preheat temperature in the range from about 500° C. to about 550° C.;

(b) further inductively heating the rail head to a temperature in the range from the A_{c3} temperature of the steel to about 100° C. above the A_{c3} temperature;

(c) cooling the rail to a temperature below the A_{c3} temperature, and

(d) thereafter quenching the rail head in at least two steps by directing a first plurality of streams of cooling fluid against the top running surface and in a direction substantially normal thereto and second and third pluralities of cooling fluid streams against the side surfaces and the lower jaw surfaces in directions off-set from directions respectively normal to such surfaces such that overlapping of the top and side cooling streams at the top corners of the rail head and consequent overcooling of the top corners are substantially avoided, and wherein the cooling medium of a first quenching step is a gas and the cooling medium of at least one subsequent quenching step comprises a liquid.

5,004,511

PROCESS FOR PRODUCING NON-WOVEN FABRICS OF CARBON FIBERS

Tatsuya Tamura, and Akio Takamatsu, both of Kamisumachi, Japan, assignors to Petoca Ltd., Tokyo, Japan

Filed Feb. 23, 1989, Ser. No. 313,835
Claims priority, application Japan, Feb. 26, 1988, 63-41975
Int. Cl.[5] B32B *11/02*
U.S. Cl. 156—89 **2 Claims**

1. A process for producing non-woven fabrics of carbon fibers which comprises mixing spun pitch fibers with infusibilized pitch fibers or carbonized pitch fibers, shaping the mixture into a sheet, insufficiently infusibilizing the shaped mixture and thereafter carbonizing the shaped mixture in an atmosphere of an inert gas to mutually fix the component fibers by utilizing

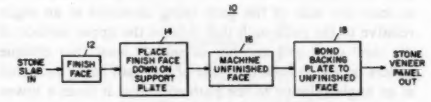
the adhering property of the insufficiently infusibilized pitch fibers during the carbonization.

5,004,512

METHOD OF MAKING A STONE VENEER PANEL

Frank Fodera, 12 Azalea Rd., Winchester, Mass. 01890

Filed Aug. 21, 1989, Ser. No. 396,359
Int. Cl.[5] B32B *31/00*; E04C *2/00*
U.S. Cl. 156—153 **14 Claims**



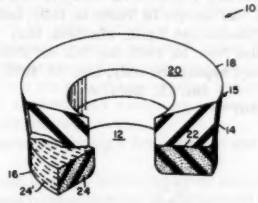
1. A method of making a stone veneer panel comprising:
first finishing one face of a slab of stone material;
then placing the slab finished face down on a support plate;
machining an unfinished face to obtain a predetermined thickness of the slab; and
bonding a backing sheet to said unfinished face of said stone slab to produce a composite stone veneer panel.

5,004,513

METHOD FOR FORMING A FIBER COMPOSITE SEALING ELEMENT

Steve Bemis, Houston, and Erwin E. Stocker, Cypress, both of Tex., assignors to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 934,074, Nov. 24, 1986. This application Sep. 26, 1988, Ser. No. 249,059
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—191 **3 Claims**



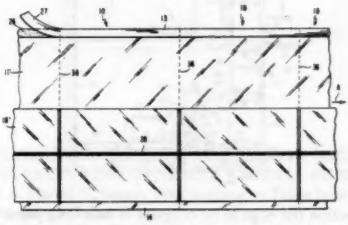
1. A method for producing a piston rubber sealing element having a cylindrical body comprising a sealing lip portion of relatively low stiffness and a reinforced base portion of relatively high stiffness, comprising the steps of:
forming a stock comprising an uncured elastomer and discrete reinforcing fibers having an aspect ratio from about 10 to about 1 into a composite sheet in which the fibers are substantially aligned unidirectionally in the sheet longitudinally thereof;
rolling up such sheet on itself on a mandrel about its axis into a multilayered sandwich in the form of a volute roll with the fibers of the sheet oriented generally in the direction of rolling and thereby generally concentrically in relation to the axis of the mandrel, with a portion of the fibers being positioned circumferentially at the outer diameter of the volute roll;
forming a separate mass of uncured elastomeric material;
positioning at least a portion of the volute roll sandwich and mass of uncured elastomeric material in a mold cavity of desired shape; and
pressurizing and heating the volute roll sandwich and mass of elastomer together in the mold to cure the same into an integral chemically bonded sealing element in which the cured sandwich with oriented fibers serves as the reinforced base portion, and the cured elastomer mass serves as the sealing lip portion.

5,004,514

METHOD OF MAKING PROTECTIVE BOOK COVERINGS

Joseph S. Pugliese, Lewisburg, and Charles L. Garman, Jersey Shore, both of Pa., assignors to Brodart Co., Williamsport, Pa.

Division of Ser. No. 330,213, Mar. 29, 1989, Pat. No. 4,893,837. This application Sep. 14, 1989, Ser. No. 407,296
Int. Cl.[5] B32B *31/18*
U.S. Cl. 156—251 **5 Claims**



1. A method of making protective book coverings, comprising the steps of:
providing a length of relatively wide plastic sheet material having two parallel longitudinal edges,
providing a length of relatively narrow plastic sheet material having two parallel longitudinal edges,
placing a face of the narrow length of material against a face of the wide length of material with the longitudinal edges of both lengths parallel to one another, the narrow material being closer to one of the longitudinal edges of the wide material than to the other,
heat sealing the two lengths of material together along a line parallel to the longitudinal edges of the material, the heat seal line being spaced from both longitudinal edges of the narrow length of material, and the heat seal line weakening the two lengths of material so that they can be torn along that line, and
heating and severing both lengths of material along lines transverse to the longitudinal edges thereof, the heat serving to seal together the two lengths of material along said transverse lines, and the severing serving to produce individual book coverings, each covering having two pockets, for accommodating the front and rear covers of a book, and a section extending from one of the pockets long enough to wrap around the spine of a book when a book cover is placed within that pocket.

5,004,515

AUTOMATIC PAPER FEEDER

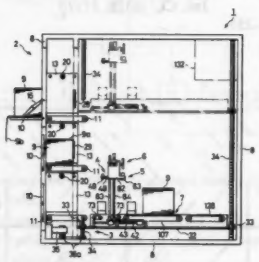
Yukichi Nebashi, and Takaaki Wada, both of Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Apr. 22, 1988, Ser. No. 184,917
Int. Cl.[5] B32B *31/00*; B31F *5/00*
U.S. Cl. 156—350 **7 Claims**

1. An automatic paper feeder which automatically couples a plurality of pieces of folded long paper to each other and then continuously feeds said pieces, comprising:
a conveyance means for conveying said long paper;
sliders;
a beam supported by said sliders so that said beam can be moved perpendicularly to the surface of said long paper;
suction members disposed on said beam and juxtaposed along the width of said long paper;
a detection means for detecting the uppermost layer of said folded long paper; and

a restrictor disposed on said beam and having a reference surface which faces in the direction reverse to that of conveyance of said long paper, said reference surface contacting said long paper so that said long paper is pushed in for sure positioning; control means; and

means for moving said beam toward a surface facing in the direction of conveyance of said long paper responsive to said control means when the uppermost layer of said folded long paper is detected by said detection means to



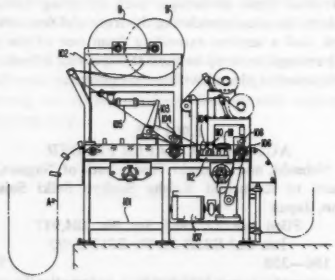
position the edge to be coupled of said long paper below said suction members, wherein said restrictor having the reference surface restricts said long paper and is movable between a position in which said restrictor is protruded toward the paper suction surfaces of said suction members and a position in which said restrictor is retracted away from said paper suction surfaces; and when said long paper is set in a position to be coupled, said restrictor is in said position in which said restrictor is retracted away from said paper suction surfaces.

5,004,516

APPARATUS FOR BONDING ADHESIVE RUBBER TAPE TO BOTH EDGES OF A STEEL CORD FABRIC

Yukihiro Koga, and Yukio Koyama, both of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1989, Ser. No. 334,547
Claims priority, application Japan, Apr. 7, 1988, 63-84064
Int. Cl.[5] B31F *5/08*
U.S. Cl. 156—463 **3 Claims**



1. An apparatus for applying adhesive rubber tape along at least one of two respectively opposing edges of a steel cord fabric, comprising:

feed means, including rotatably driven feed rollers, for feeding the steel cord fabric along a feed path;

supply means for supplying the adhesive rubber tape to said feed means; and

folding/bonding means, for folding and bonding the adhesive rubber tape along the at least one edge of the steel cord fabric, comprising

means, including a press roller, for pressing about half of the width of the adhesive rubber tape onto an upper surface of the steel cord fabric along the at least one edge thereof to bond the adhesive rubber tape to the steel cord fabric,

means, including oblique rollers having surfaces formed of elastic material which is conformable to the shape of the edges of the steel cord fabric, for folding an unbonded portion of the adhesive rubber tape about the edges of the steel cord fabric, said oblique rollers comprising at least two oblique rollers on at least one side of the path of the steel cord fabric, each of said oblique rollers being inclined at a different angle relative to the path of the steel cord fabric, one of said at least two oblique rollers on the at least one side of the path being mounted at an angle relative to the path such that it faces the upper surface of the steel cord and another of said at least two oblique rollers on the at least one side of the path being mounted at an angle relative to the path such that it faces a lower surface of the steel cord fabric,

means, including a taper roller, for press-fitting the folded portion of the adhesive rubber tape onto the steel cord fabric to bond the adhesive rubber tape in position about the at least one edge of the steel cord fabric, and

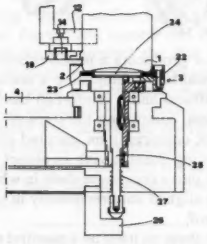
means for forcing said taper roller to rotate in synchronism with said driven feed rollers even if slippage occurs between the steel cord fabric and said taper roller.

5,004,517

DEVICE FOR THE ALIGNMENT OF BOTTLES PROVIDED WITH A REFERENCE MOLDING IN ROTARY LABELING MACHINERY

Ireneo Orlandi, San Giorgio Di Mantova, Italy, assignor to Alfa Costruzioni Meccaniche S.p.A., Mantova, Italy

Filed Nov. 14, 1989, Ser. No. 437,076
Claims priority, application Italy, Dec. 14, 1988, 40182 A/88
Int. Cl.[5] B65C *9/00*
U.S. Cl. 156—567 **4 Claims**



1. A device for the alignment of bottles incorporating a positively engageable reference (2), in rotary labeling machines, comprising:

a circular turntable, rotatable about a vertical axis,

a plurality of peripheral dishes (3) distributed uniformly about the periphery of the circular turntable, each rotatable about a vertical axis;

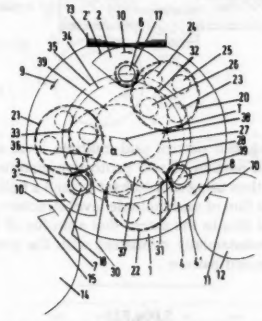
a mechanical stop (18) capable of alternating movement between an at-rest position and a position of engagement with the reference (2) afforded by a bottle occupying one of the rotatable dishes (3);

mechanical means by which to produce alternating movement of the mechanical stop each time a bottle is presented on one of the rotatable dishes.

5,004,518
LABELLING MACHINE FOR OBJECTS SUCH AS BOTTLES OR THE LIKE

Rudolf Zodrow, Düsseldorf, Fed. Rep. of Germany, assignor to ETI-TEC Maschinenbau GmbH, Erkrath, Fed. Rep. of Germany

Filed Apr. 7, 1989, Ser. No. 335,478
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1988, 3811869; Mar. 15, 1989, 3908378
Int. Cl.[5] B65C *3/16*
U.S. Cl. 156—568 **11 Claims**



1. Labelling machine for supplying labels to bottles or the like; said labelling machine including a plurality of stations located one behind another along a track; the plurality of stations including an adhesive application station, a label feed station, and a label transfer station; said labelling machine comprising:

a rotating support mounted on a central axis for rotation by each of the plurality of stations;

at least one extracting means for the labels;

said extracting means including a drive shaft means and being mounted ar said drive shaft means for rotation on said rotating support for movement by each of the stations during each rotation of said rotating support;

means for rotating said extracting means including cam means and follower means;

said cam means including a first cam disc and a second cam disc;

said first cam disc and said second cam disc being disposed below said rotating support at said central axis;

said first cam disc being an outside cam and including a first outer cam surface extending about said central axis;

said second cam disc being an outside cam and including a second outer cam surface extending about said central axis;

said first cam disc being disposed axially above said second cam disc;

means for operably connecting said follower means to said drive shaft means;

said follower means being mounted for rotation about a follower axis on said rotating support to cause said rotation of said extracting means;

said follower means including a follower support element disposed in a plane axially above said first cam disc;

said follower means including a first pair of followers aligned with said first cam disc for making contact with said first outer cam surface and a second pair of followers aligned with said second cam disc for making contact with said second outer cam surface;

each of said first pair of followers and said second pair of followers having said followers thereof being mounted on said followers support element at substantially opposite sides of said follower axis;

said follower means rotating about said cam means for producing said rotation of said extracting means;

said first pair of followers and said second pair of followers defining a moving equivalent cam surface;

said first cam disc and said second cam disc defining a fixed equivalent cam surface;

said moving equivalent cam surface being for rotation about said fixed equivalent cam surface with point by point rolling contact therebetween when said follower means is rotated about said cam means;

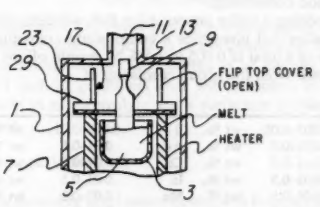
each of said followers including a center of rotation which is radially located within said moving equivalent cam surface; and

at least a portion of at least one of said followers lying outside of said moving equivalent cam surface.

5,004,519
RADIATION HEAT SHIELD FOR SILICON MELT-IN MANUFACTURING OF SINGLE CRYSTAL SILICON

Farouk A. Hariri, Sherman, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 941,008, Dec. 12, 1986, abandoned. This application Sep. 12, 1988, Ser. No. 244,623
Int. Cl.[5] C30B *15/00, 35/00*
U.S. Cl. 156—620.4 **11 Claims**



1. A method of melting silicon in a crucible, comprising the steps of:

(a) providing an open top crucible having silicon therein;

(b) covering the open top of said crucible with a heat radiation shield;

(c) heating said silicon to provide a melt thereof in said crucible;

(d) uncovering said crucible by an amount sufficient to allow single crystal silicon to be pulled from the crucible; and

(e) wherein step (d) includes moving said crucible in a vertical direction to uncover said crucible by lifting said heat radiation shield.

5. A furnace for melting silicon, comprising:

a crucible having an open top and movable in a vertical direction;

a heater for heating said crucible positioned adjacent thereto;

a radiation shield positioned over the open top of said crucible and covering the open top thereof and pivotally movable to an open position in response to vertical upward movement of said crucible; and

wherein said shield includes a plurality of segments each separately pivotally movable and having a counterweight positioned at an edge of each of said segments such that when said shield is in an open position exposing the open top of said crucible, said counterweights maintain corresponding segments in the open position and when said shield is in a closed position covering the open top of said crucible, said counterweights maintain corresponding segments in the closed position.

5,004,520

METHOD OF MANUFACTURING FILM CARRIER

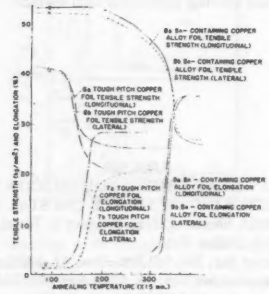
Masahiro Tsuji; Susumu Kawauchi, both of Kangawa, and Hiroshi Nakayama, Tokyo, all of Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

Division of Ser. No. 160,479, Feb. 25, 1988. This application Dec. 1, 1989, Ser. No. 444,575

Claims priority, application Japan, Mar. 4, 1987, 62-47540; Jul. 7, 1987, 62-167896; Jul. 7, 1987, 62-167897

Int. Cl.[5] C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—630 **24 Claims**


TENSILE STRENGTH (kg/mm²) AND ELONGATION (%)
ANNEALING TEMPERATURE (1/15 min.)
50
40
30
20
10
0
100
200
300
0a Sn-CONTAINING COPPER ALLOY FOIL TENSILE STRENGTH (LONGITUDINAL)
0b Sn-CONTAINING COPPER ALLOY FOIL TENSILE STRENGTH (LATERAL)
6a TOUGH PITCH COPPER FOIL TENSILE STRENGTH (LONGITUDINAL)
6b TOUGH PITCH COPPER FOIL TENSILE STRENGTH (LATERAL)
7a TOUGH PITCH COPPER FOIL ELONGATION (LONGITUDINAL)
7b TOUGH PITCH COPPER FOIL ELONGATION (LATERAL)
0a Sn - CONTAINING COPPER ALLOY FOIL ELONGATION (LONGITUDINAL)
0b Sn - CONTAINING COPPER ALLOY FOIL ELONGATION (LATERAL)

1. A method for manufacturing a film carrier for mounting semiconductor chips or other electronic components in place, said method comprising:

(a) providing a roller copper alloy foil, wherein rolled copper alloy foil comprises a composition consisting essentially of a total of 0.005 to 1.5% by weight of one or more selected from the group consisting of

P	0.005–0.05	wt %,	B	0.005–0.05	wt %,
Al	0.01–0.5	wt %,	As	0.01–0.5	wt %
Cd	0.01–0.5	wt %,	Co	0.01–0.5	wt %,
Fe	0.01–0.5	wt %,	In	0.01–0.5	wt %,
Mg	0.01–0.5	wt %,	Mn	0.05–0.2	wt %,
Ni	0.01–0.5	wt %,	Si	0.01–0.5	wt %,
Sn	0.01–0.5	wt %,	Te	0.01–0.5	wt %,
Ag	0.01–1	wt %,	Cr	0.01–1	wt %,
Hf	0.01–1	wt %,	Zn	0.01–1	wt % and
Zr	0.01–1	wt %			

and the remainder Cu with inevitable impurities,

(b) laminating said rolled copper alloy foil onto a resin base film, and

(c) etching said rolled copper alloy foil.

5,004,521

METHOD OF MAKING A LEAD FRAME BY EMBOSSING, GRINDING AND ETCHING

Toru Makino, Shizuoka, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Nov. 20, 1989, Ser. No. 438,318

Claims priority, application Japan, Nov. 21, 1988, 63-294270; Nov. 21, 1988, 63-294271

Int. Cl.[5] C23F *1/00*

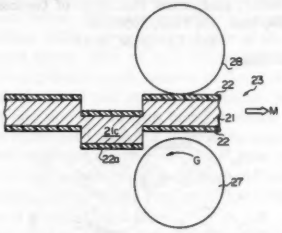
U.S. Cl. 156—645 **11 Claims**

1. A process of shaping a thin metal film into a lead frame, comprising the steps of:

(a) preparing a thin metal film, an etchant effective to etch the metal film and a protective material resistive to etching by the etchant;

(b) coating the entire surface of said metal film with a film of said protective material having a thickness, so as to form a multiple level structure having the metal film and a protective film;

(c) embossing a predetermined pattern on said multiple level structure by displacing a part of said multiple level structure, the distance of said displacement being greater than the thickness of said protective film so as to thereby break slits in said protective film, said slits exposing said metal film, said slits being substantially consistent with a profile of said predetermined pattern; and



(d) removing said part of said multiple level structure by grinding a portion of said protective material from said part, and then using said etchant to etch a hollow space in said metal film of said multiple level structure, by etching said metal film to the extent that a profile of said hollow space is substantially consistent with the profile of said predetermined pattern.

5,004,522

METHOD OF TREATING PHOTOGRAPHIC PROCESS WASTE LIQUOR THROUGH CONCENTRATION BY EVAPORATION

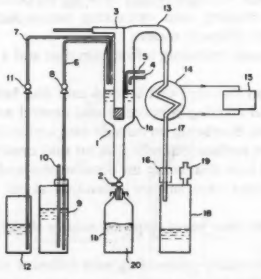
Shigeharu Koboshi; Kazuhiro Kobayashi; Nobutaka Goto; Masayuki Kurematsu, and Naoki Takabayashi, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 126,213, Nov. 27, 1987, abandoned. This application Dec. 20, 1989, Ser. No. 453,014

Claims priority, application Japan, Dec. 3, 1986, 61-288328

Int. Cl.[5] B01D *1/00*

U.S. Cl. 159—47.003 **5 Claims**



1. A method of treating photographic process waste liquor through concentration by evaporation, consisting essentially of the steps:

(a) supplying waste liquor to an evaporating vessel;

(b) evaporating liquid from photographic process waste liquor by heating directly an upper part of the photographic process waste liquor with a heating means immersed in the liquor;

(c) maintaining at least a 5° C. differential between the temperature of the photographic process waste liquor in the heated upper part of the waste liquor and the temperature at a bottom part of the photographic process waste liquor thereby concentrating the photographic waste liquor whereby solute precipitates;

(d) allowing solute which precipitates from the photographic process waste liquor to settle toward said bottom part;

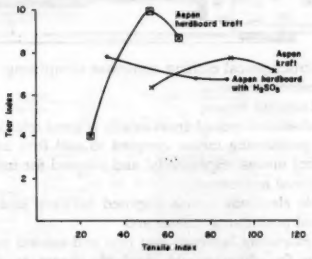
(e) collecting the solute in a settling-depositing chamber from the bottom part of the waste liquor; and
(f) removing the solute from the settings depositing chamber thereby to restrain formation of noxious gases.

5,004,523

DELIGNIFICATION OF LIGNOCELLULOSIC MATERIALS WITH MONOPEROXYSULFURIC ACID

Edward L. Springer, Madison, and James L. Minor, Middleton, both of Wis., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 30, 1989, Ser. No. 330,547
Int. Cl.[5] D21C *3/04*
U.S. Cl. 162—76 **2 Claims**



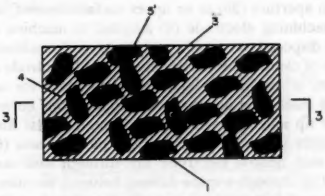
1. A method of fractionating lignocellulosics by oxidative alteration of the lignin component followed by its extraction, the lignocellulosics being defiberized, destructured or ground prior to treatment, the method comprising:
(a) treating the lignocellulosic with an acidic oxidative aqueous solution having a pH range of 0 to 1.8, a sulfuric acid weight concentration of 0.16% to 11% based on solution, a monoperoxysulfuric acid weight concentration of 0.5% to 9% based on solution, at a temperature of up to 100° C. for a time period of up to 290 hours and a solution to wood ratio of 1:1–25:1, to form a lignocellusic residue;
(b) separating the lignocellulosic residue from the solution;
(c) extracting the lignin from the lignocellulosic residue.

5,004,524

REFRACTORY OXYCOMPOUD/REFRACTORY HARD METAL COMPOSITE AND USED IN MOLTEN SALT ALUMINUM PRODUCTION CELLS

Jean-Jacques Duruz, Geneva, Switzerland, assignor to Moltech Invent S.A., Luxembourg

PCT No. PCT/EP88/00817, § 371 Date Apr. 28, 1989, § 102(e) Date Apr. 28, 1989, PCT Pub. No. WO89/02423, PCT Pub. Date Mar. 23, 1989
PCT Filed Sep. 8, 1988, Ser. No. 350,478
Int. Cl.[5] C25C *7/00*
U.S. Cl. 204—243 R **13 Claims**



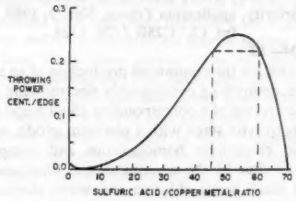
13. An aluminum reduction cell comprising a component having an aluminum-wettable surface in contact with molten aluminum during operation of the cell and which does not serve to conduct electric current, characterized in that the component comprises a solid body consisting of fused refractory oxycompound cast as a solid block having a multiplicity of discrete lumps or pieces of aluminum-wettable Refractory Hard Metal cast in aluminum wettable the surface of the block, the Refractory Hard Metal lumps or pieces being separated by fused refractory oxycompound, the surface of said block being rendered wettable by molten aluminum by said discrete lumps or pieces of Refractory Hard Metal.

5,004,525

COPPER ELECTROPLATING COMPOSITION

Roger F. Bernards, Wellesley; Gordon Fisher, Sudbury, and Wade Sonnenberg, Foxboro, all of Mass., assignors to Shipley Company Inc., Newton, Mass.

Continuation of Ser. No. 235,051, Aug. 23, 1988, Pat. No. 4,897,165. This application Nov. 20, 1989, Ser. No. 438,020
The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.
Int. Cl.[5] C25D *3/38*
U.S. Cl. 204—52.1 **4 Claims**



1. An aqueous acid copper plating solution comprising one or more bath soluble copper salts in a concentration sufficient to provide a total copper ion content in an amount varying between 1 and 10 grams per liter and sufficient to support plating, acid as an electrolyte and a surfactant conforming to the formula

$$R—O—(CH_2CH_2O)_nH$$

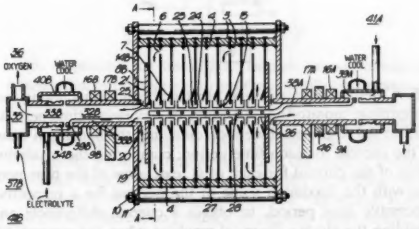
where R is an aryl or alkyl group containing from about 2 to 20 carbon atoms and n is an integer whereby the molecular weight of the surfactant is at least 500,000.

5,004,526

PROCESS FOR EFFECTING ELECTROCHEMICAL REACTION

Colin Ramshaw, Norley, United Kingdom, assignor to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 322,716, Mar. 13, 1989, Pat. No. 4,931,166. This application Mar. 2, 1990, Ser. No. 487,183
Claims priority, application United Kingdom, Mar. 14, 1988, 8805991
Int. Cl.[5] C25B *3/00*
U.S. Cl. 204—73 A **5 Claims**



1. A process for effecting electrochemical reaction between a first liquid phase and second liquid phase in an electrode

assembly comprising an electrode impermeable to the two phases, said process comprising:

(a) rotating and electrically charging the electrode assembly,

(b) containing the first phase within a cell bounded by said impermeable electrode;

(c) charging the second phase to the cell by supplying the second phase to an annular weir provided on one face of the electrode in such a way as to form a thin film of said second liquid phase over said one face of the electrode, and

(d) removing a reaction product of the two phases from the electrode.

5,004,527

CONTINUOUS ELECTROLYTIC PRODUCTION OF ALKALI METAL PERCHLORATES

Jean-Christophe Millet, Saint-Genis-Laval, and Michel Jaccaud, Lyons, both of France, assignors to Atochem, Puteaux, France

Filed Nov. 9, 1989, Ser. No. 435,289

Claims priority, application France, Nov. 9, 1988, 88 15137

Int. Cl.[5] C25B *1/26, 1/28*

U.S. Cl. 204—82 **15 Claims**

1. A process for the continuous production of an alkali metal perchlorate, comprising continuously electrolyzing an aqueous solution electrolyte of a corresponding alkali metal chlorate in a single electrolytic stage with a platinum anode, while maintaining said electrolyte homogeneous and compositionally uniform over time by the continuous and simultaneous introduction of alkali metal chlorate and water thereto in equal quantities to the chlorate and the water which are continuously withdrawn from the single electrolytic stage, wherein the composition of the electrolyte is such that alkali metal perchlorate can be directly separated therefrom by crystallization, and continuously directly separating desired alkali metal perchlorate from such solution of electrolysis.

5,004,528

METHOD AND APPARATUS FOR ELECTRO CHEMICAL MACHINING

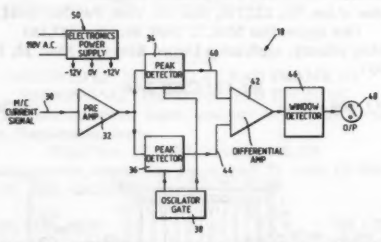
David R. England, Bristol, England, assignor to Rolls-Royce plc, London, England

Filed Feb. 2, 1990, Ser. No. 473,734

Claims priority, application United Kingdom, Feb. 14, 1989, 8903275

Int. Cl.[5] B23H *3/02*

U.S. Cl. 204—129.2 **5 Claims**



5. A method of disabling an electro chemical machining tool comprising: monitoring, in a series of successive time periods, current fed to the machine tool; detecting the maximum value of the current for each time period; comparing the maximum value of the current for each of at least some of the time periods with the maximum value of the current for a respective successive time period, to obtain a current difference; and disabling the electro chemical machine when the current difference is greater than a predetermined value, wherein the comparison operation compares the maximum value of the current of each time period with the maximum value of the current in the immediately succeeding time period.

5,004,529

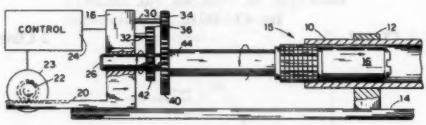
ELECTROCHEMICAL ETCHING APPARATUS

Alexander Vishnitsky, Henrietta, N.Y., assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 18, 1989, Ser. No. 423,766

Int. Cl.[5] B23H *9/00, 3/04*

U.S. Cl. 204—212 **9 Claims**



1. Electrochemical etching apparatus comprising:

first control means;

second control means;

first and second spaced apart axially aligned relatively rotatable positioning means coupled to said first and second control means respectively, and adapted for independent rotational movement;

rotatable electrode means disposed between said first and second positioning means; and

means extending between said first and second positioning means for aligning said electrode means to a position intermediate the positions of the first and second positioning means.

5,004,530

DISCHARGE MACHINING APPARATUS WITH LIQUID FLOW CONTROL

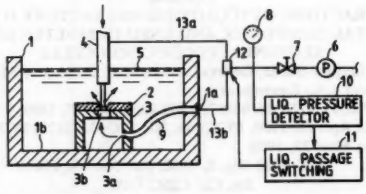
Hidehiko Tanaka, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1989, Ser. No. 381,927

Claims priority, application Japan, Jul. 20, 1988, 63-178980

Int. Cl.[5] B23H *3/10, 7/36, 9/14*

U.S. Cl. 204—224 M **5 Claims**



1. A discharge machining apparatus, comprising: a machining tank (1), a machining table (3) disposed in said tank and having an aperture (3*b*) in an upper surface thereof, a hollow tipped machining electrode (4) adapted to machine a workpiece (2) disposed over said aperture on said machining table by means of electric discharge between said electrode and said workpiece, a machining liquid supply system for normally supplying machining liquid to a machining zone between said electrode tip and said workpiece through a first machining liquid supply passage extending from pump means (6) down through said hollow electrode tip, through said machining zone, and up through a space defined between an outer peripheral surface of said machining electrode and said workpiece to flush away particles sputtered from the workpiece, means for detecting a pressure drop in said first machining liquid supply passage to a value smaller than a predetermined value caused by a breakthrough in a bottom of the workpiece over the aperture, and means responsive to an output of said detecting

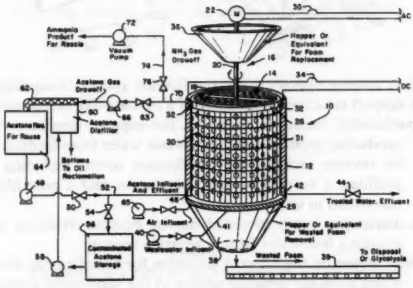
means to supply machining liquid through a second machining liquid supply passage extending from said pump means up through the machining table aperture and workpiece breakthrough, through the machining zone, and up through said space between the outer peripheral surface of the electrode and the workpiece to continue the flushing away of said particles.

5,004,531

TREATMENT OF CONCENTRATED INDUSTRIAL WASTEWATERS ORIGINATING FROM OIL SHALE AND THE LIKE BY ELECTROLYSIS POLYURETHANE FOAM INTERACTION

Joan E. Tiernan, 38 Clay Ct., Novato, Calif. 94947

Division of Ser. No. 148,721, Jan. 26, 1988, Pat. No. 4,929,359.
This application Mar. 3, 1989, Ser. No. 318,571
Int. Cl.[5] C02F *1/461*
U.S. Cl. 204—307 **7 Claims**



1. Appartus for removing pollutants from a liquid, said apparatus comprising, in combination:

a vessel for receiving said liquid to be treated;

shapes of ionized polyurethane foam disposed within said vessel for removing pollutants from said liquid to be treated;

means for applying a low level electrical current through said shapes and said liquid in said vessel which creates an electrolysis reaction with said liquid that enhances pollutant removal; and

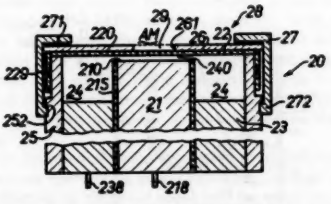
means for producing relative motion of said liquid over said ionized polyurethane foam shapes for aiding removal of pollutants from said liquid.

5,004,532

AMPEROMETRIC CELL

John M. Hale, Meinier, Switzerland, assignor to Orbisphere Corporation, Switzerland

Continuation of Ser. No. 743,155, Jun. 10, 1985, abandoned.
This application Mar. 27, 1987, Ser. No. 31,222
Int. Cl.[5] G01N *27/40*
U.S. Cl. 204—415 **4 Claims**



1. A membrane-enclosed amperometric cell for use in determining the concentration of an electroactive species of interest in an ambient medium; said cell comprising:

a working electrode having a sensing area defined by an essentially circular outer periphery;

a film of a liquid electrolyte covering said sensing area and being in electrolytic contact with counter electrode, said film having a substantially uniform thickness;

a polymer membrane that is substantially impermeable to said electrolyte but permeable to said electroactive species, said membrane extending in substantially conforming manner over said sensing area and said electrolyte film thereon, and said membrane having a substantially uniform thickness;

a barrier layer that is substantially impermeable to said electroactive species and is arranged between said ambient medium and said sensing area;

said barrier layer positioned between said ambient medium and said polymer membrane in sealing engagement with the latter;

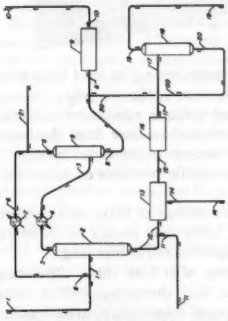
said barrier layer having at least one opening positioned relative to said sensing area so that direct access of said electroactive species to said sensing area is limited to a portion of said sensing area within an inner periphery that is coaxial with said outer periphery and together with the latter defines a circumjacent margin having a width that is at least three times greater than said thickness of said polymer membrane; said electrolyte film on said sensing area which confronts said barrier layer circumjacent margin being of a width and thickness that is effective to prevent lateral diffusion of said electroactive species through said electrolyte film beyond said circular outer periphery of said sensing area.

5,004,533

PROCESS FOR TREATING AN ORGANIC STREAM CONTAINING A NON-DISTILLABLE COMPONENT TO PRODUCE AN ORGANIC VAPOR AND A SOLID

Tom N. Kalnes, La Grange, and Robert B. James, Jr., Northbrook, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Mar. 12, 1990, Ser. No. 491,768
The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.
Int. Cl.[5] C10B *55/00*
U.S. Cl. 208—50 **22 Claims**



19. A process for treating an organic stream containing a non-distillable component to produce distillable organic compounds and a solid which process comprises the steps of:

(a) contacting said organic stream containing a non-distillable component with a first hydrogen-rich gaseous stream having a temperature greater than the organic stream in a flash zone at flash conditions thereby increasing the temperature of the organic stream and vaporizing at least a portion thereof to produce an organic vapor stream comprising hydrogen and a heavy stream comprising said non-distillable component;

(b) reacting at least a portion of said heavy stream compris-

ing said non-distillable component in the presence of hydrogen in a pyrolysis zone at pyrolysis conditions to produce a thermally stabilized volatile organic stream comprising hydrogen and a solid;

(c) contacting at least a portion of said organic vapor stream comprising hydrogen produced in step (a) and at least a portion of said thermally stabilized volatile organic stream comprising hydrogen produced in step (b) with a hydrogenation catalyst in a hydrogenation reaction zone at hydrogenation conditions;

(d) separating at least a portion of said organic vapor stream comprising hydrogen produced in step (a) to produce a second hydrogen-rich gaseous stream;

(e) recycling at least a portion of said second hydrogen-rich gaseous stream recovered in step (d) to provide at least a portion of said first hydrogen-rich gaseous stream utilized in step (a); and

(f) recovering distillable hydrocarbonaceous compounds from the effluent of said hydrogenation reaction zone.

5,004,534

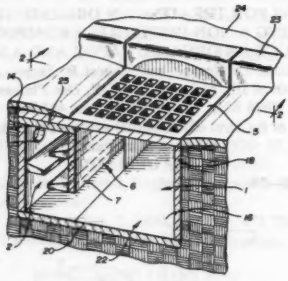
CATCH BASIN

Vincenzo Buzzelli, 226 Terrace Ave., Jersey City, N.J. 07307

Filed May 16, 1988, Ser. No. 194,548

Int. Cl.[5] B01D *21/00*

U.S. Cl. 210—164 **4 Claims**



1. In a catch basin having an inlet zone and an outlet zone separated by a vertical baffle wherein:

(i) the vertical baffle is positioned in such a manner that liquid is permitted to flow from the bottom of the inlet zone to the bottom of the outlet zone;

(ii) the vertical baffle provides an inner wall for the outlet zone; and

(iii) the outlet zone has an outer wall parallel to the vertical baffle, said outer wall having an outlet port at its upper end, the improvement comprising;

locating a series of at least three alternating baffles in the outlet zone, said alternating baffles being parallel, and bearing a spaced relationship, to each other; the odd numbered baffles in the series being attached at right angles to the vertical baffle; the even numbered baffles in the series being attached at right angles to the outer wall; and each baffle in the series extending just beyond the midpoint between the vertical baffle and the outer wall, the first baffle in the series being attached to the bottom of the vertical baffle and the last baffle in the series being attached to the vertical baffle at a point below an imaginary line running from the bottom of the outlet port to the vertical baffle, said imaginary line being parallel to the alternating baffles.

5,004,535

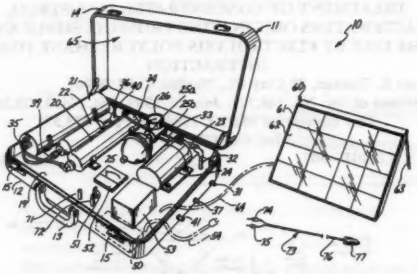
WATER PURIFICATION SYSTEM

Robert S. Bosko, and Thomas C. Barnes, both of Hermosa Beach, Calif., assignors to Aquatec Water Systems Incorporated, Anaheim, Calif.

Filed Apr. 17, 1989, Ser. No. 339,392

Int. Cl.[5] B01D *61/10*

U.S. Cl. 210—90 **8 Claims**



1. A reverse osmosis water purification system, comprising:

a support structure in the form of a suitcase-like component;

purification means mounted on the support structure for producing product water and waste water from feedwater by reverse osmosis, the purification means including a prefilter, a reverse osmosis membrane, and a post filter connected in series;

a diaphragm pump mounted on the support structure for pumping feedwater from a separate source;

inlet means on the support structure for coupling the feedwater from the separate source to the diaphragm pump;

accumulator means mounted on the support structure and coupled to the pump for accumulating the feedwater from the pump for coupling to the prefilter;

first outlet means on the support structure for outletting the product water from the post filter;

second outlet means on the support structure for outletting the waste water from the purification means;

a battery mounted on the support structure for powering the diaphragm pump;

a solar panel mounted on the support structure for powering the diaphragm pump; and

means mounted on the support structure for enabling a user to connect the diaphragm pump to an external source of electrical power.

5,004,536

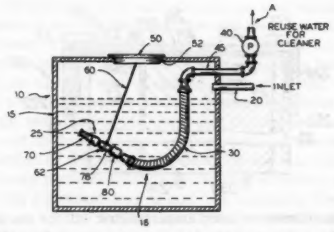
WATER RECLAMATION APPARATUS

Edward Geisler, 150 Pfaff Dr., Frankfort, Ill. 60423

Filed Apr. 25, 1989, Ser. No. 343,047

Int. Cl.[5] B60S *3/00*; B01D *29/00*

U.S. Cl. 210—136 **18 Claims**



13. A vehicle washing water reclamation system comprising:

a vehicle washing water reclamation tank for holding water to be recycled,

means for pumping water out of said tank,

conduit means for conveying water from said reclamation tank, a first end of said conduit means extending beneath the level of said water in said reclamation tank, a second end of said conduit means being coupled to said pumping means;

filter means coupled to the first end of said conduit means for preventing debris in the reclamation tank from entering said conduit means; and

first and second individual one-way valve means, operatively connected in series within said conduit means, for allowing water to flow from said reclamation tank through said conduit means and for preventing water from flowing back into said reclamation tank form said conduit means under conditions where one of said valve means is held in an open position, constructed and arranged to retain water in said conduit means at all times, including periods when said pump is not activated.

5,004,537

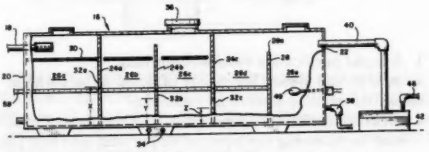
OZONE WATER PURIFICATION SYSTEM

James J. Brown, 43 Oregon La., Boca Raton, Fla. 33487

Filed Dec. 19, 1989, Ser. No. 452,307

Int. Cl.[5] C02F *1/78*

U.S. Cl. 210—192 **8 Claims**



1. A water purification tank comprising:

(a) a plurality of baffle members extending across the tank to divide the interior of the tank into a plurality of chambers;

(b) contaminated water inlet means in fluid communication with an upstream chamber;

(c) a water passage defined by each of the baffles to allow water to pass through each baffle member into an adjacent downstream chamber, the height of each passage from the bottom of the tank being progressively lower from an upstream to a downstream direction;

(d) a water level control baffle extending across the tank downstream of a baffle member, the water level control baffle being spaced from a top of the tank to define an overflow weir to control the water level within the tank, wherein each of said baffle members extends from the bottom of said tank to a point above the water level and each of said passages has an upper extent below the water level;

(e) ozone distribution means connected to an ozone source, said ozone distribution means extending through at least one chamber to distribute ozone into the water located in the at least one chamber; and,

(f) water outlet means located downstream of the water level control baffle.

5,004,538

CONTROL ARRANGEMENT FOR THE CHROMATOGRAPHY OF LIQUID

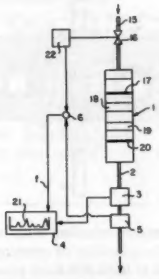
Helmut Apfel, Loheweg 5, 8039 Puchheim, Fed. Rep. of Germany

Continuation of Ser. No. 245,300, Sep. 16, 1988, abandoned. This application Mar. 2, 1990, Ser. No. 492,319

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1986, 3608227

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—198.2 **5 Claims**



1. A control arrangement for a liquid chromatograph to compensate for non-uniform flow rates past a chromatograph detector, said arrangement comprising:

(a) a separation column having an inlet for receiving a solvent and an outlet for discharging an eluate, said separation column being adapted to be charged with a specimen to be separated into its individual fractions;

(b) a detector for detecting each fraction of the specimen in the eluate and for generating a detector signal proportional to the substance concentrations of the fractions as well as the volume of each fraction;

(c) an analyzing device having an integrator for integrating said detector signal over a given time interval to provide an integrator output value indicative of the quantity of substance to be determined contained in the specimen;

(d) a flow meter for determining the actual flow rate of eluate past said detector for a given time period and for generating a signal representative of a desired flow rate;

(e) a standard flow rate signal generator for providing a standard signal representative of a desired flow rate;

(f) a comparator for generating a correction factor signal equal to the ratio of said actual flow rate signal to said standard signal for a given time interval; and

(g) compensating means for compensating for variations in the actual flow rate from the standard flow rate by directly correcting the integrator output value as a function of the correction factor to alter the time interval of the integrator to correspond to the actual flow rate of eluate past the detector to permit the integrator of the analyzing device to operate correctly in real time even when the actual flow rate deviates from the desired flow rate.

5,004,539

SUPERCONDUCTING MAGNETIC SEPARATOR

Joseph G. Colwell, Jr., Thomson, Ga., assignor to J. M. Huber Corporation, Borger, Tex.

Filed Oct. 12, 1989, Ser. No. 420,760

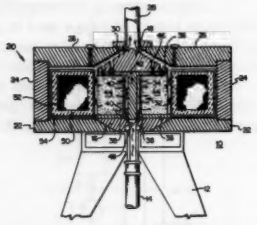
Int. Cl.[5] B01D *35/06*

U.S. Cl. 210—222 **6 Claims**

1. A superconducting magnetic separator which comprises a support, a separator canister, an inlet tube for injecting into said canister a slurry of water and kaolin which contains at least some ferromagnetic particles, an outlet tube for conducting the slurry from the canister, and a superconductor magnet comprising at least one superconductor coil, and Dewar means containing said coil for maintaining said superconductor coil at

or below a threshold temperature at which superconductance takes place, and defining a cylindrical space coaxial with said coil in which said canister is contained,

said canister comprising first and second axial pole pieces disposed on opposite ends of said canister, one of which includes means for conducting the slurry into the canister and one of which includes means for conducting the slurry from the canister; a support post extending axially from the first to the second pole piece to resist the high compressive forces imposed on the canister by the superconductor magnet, said post having at least one axial



passage therein communicating with one of said inlet and outlet tubes, and a plurality of openings through a radial surface from said at least one axial passage, and a packing of ferromagnetic material filling said canister outside said post such that the slurry flow is conducted in said axial passage, through said openings and through said packing to contact the ferromagnetic particles with said packing so that said particles are removed magnetically from said slurry; and ferromagnetic means disposed outside said superconductor magnet to define a flux return path between said pole pieces.

5,004,540

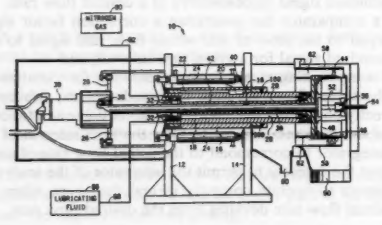
INVERTIBLE FILTER-TYPE CENTRIFUGE WITH IMPROVED BEARING AND SEAL ASSEMBLY

James B. Hendricks, Lakeside, Calif., assignor to Ketema Process Equipment Division, Santee, Calif.

Filed Dec. 1, 1989, Ser. No. 445,010

Int. Cl.[5] B01D *33/067*

U.S. Cl. 210—232 **12 Claims**



1. In an invertible filter centrifuge having a housing defining a centrifuge chamber with a perforated drum mounted in said chamber on the front end of a hollow shaft which is rotatably mounted at said front end by a front bearing assembly and slideably mounted on a central shaft, said central shaft having a base plate mounted on a front end thereof, a filter cloth disposed with one end attached to the drum and the other end attached to said base plate and normally disposed in an operative position within said drum, and double acting piston means for displacing the drum axially for displacing and inverting the filter cloth therefrom, the improvement comprising:

means for contacting bearings in said bearing assembly with a quantity of lubricating fluid;

a nitrogen gas pressurized seal disposed between said bearing assembly and said centrifuge chamber for inhibiting the passage of contaminants therebetween, said pressurized seal comprising a pair of opposed annular lip seals axially spaced along and contacting an outer surface of said hollow shaft; and

means for introducing a quantity of pressurized nitrogen gas between said lip seals.

5,004,541

FLUID PURIFICATION SYSTEM

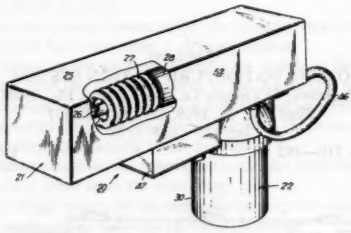
John R. Noll, Middlebury, and Stephen V. Montvila, Brookfield, both of Conn., assignors to Electrolux Water Systems, Inc., Marietta, Ga.

Continuation-in-part of Ser. No. 183,658, Apr. 19, 1988, abandoned, which is a continuation of Ser. No. 915,238, Oct. 3, 1986, Pat. No. 4,769,131, which is a continuation-in-part of Ser. No. 861,569, May 6, 1986, abandoned. This application Sep. 2, 1988, Ser. No. 240,251

The portion of the term of this patent subsequent to Nov. 6, 2007, has been disclaimed.

Int. Cl.[5] B01D *17/06, 35/06*

U.S. Cl. 210—251 **15 Claims**



1. A liquid purification system comprising:

an inlet to said system for supply of liquid to be purified;

means for emitting ultraviolet radiation;

a first conduit directly connected at one end thereof to said inlet for receiving the liquid to be purified, said first conduit having an outlet port at the other end and being transparent to the emitted ultraviolet radiation for allowing said ultraviolet radiation to impinge on the liquid throughout flow of the liquid through said first conduit;

liquid purification means, coupled to said outlet port of said first conduit, for purifying the irradiated liquid and for bringing purified, irradiated liquid to an outlet of said purification means;

a second conduit connected at one end thereof to said purification means for receiving the purified irradiated liquid, said second conduit having an outlet port at the other end and being transparent to the ultraviolet radiation emitted by said source for allowing said ultraviolet radiation to impinge on the processed liquid throughout flow of the liquid through said second conduit to the outlet port of said second conduit and a system outlet directly connected to said outlet port of said second conduit for delivering purified, twice irradiated liquid to a user, said system being arranged from inlet to outlet so as to prevent entry of external sources of contamination; and wherein the size of said means for emitting ultraviolet radiation and the size of said conduits are chosen to assure extinction of undesirable microorganisms, bacteria and viruses in liquid flowing through said conduits.

5,004,542

FILTER MEMBRANE WITH FLEXURE

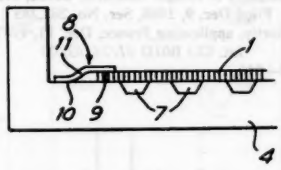
Nicholas Lyons, Horsham; William R. S. Baxter; Adrian M. Woodward, both of Cambridge, and Roger W. Clarke, Cambridge, all of England, assignors to Alcan International Limited, Montreal, Canada

Continuation of Ser. No. 143,452, Jan. 12, 1988, abandoned. This application Jun. 22, 1990, Ser. No. 545,112

Claims priority, application United Kingdom, Jan. 16, 1987, 8701055

Int. Cl.[5] B01D *65/00*

U.S. Cl. 210—356 12 Claims



1. A filter comprising a housing, a filter membrane made of porous material for filtering fluid passing through said filter, and a sheet of flexible impermeable material attached to the perimeter portion of the membrane and to the housing, to thereby mount the membrane relative to the housing in such a way as to allow the membrane to float with respect to the housing, said sheet of flexible material having

(a) two lines of securement:

(i) a first line of securement securing the flexible sheet to the membrane, and

(ii) a second line of securement securing the flexible sheet to the housing, said second line of securement being spaced, along the surface of the sheet, from the first, and

(b) a sheet portion, in the space between the two lines of securement, constituting a region of flexure operable to isolate the membrane from relative movement between the membrane material and the housing.

5,004,543

CHARGE-MODIFIED HYDROPHOBIC MEMBRANE MATERIALS AND METHOD FOR MAKING THE SAME

Malcolm G. Pluskal, Bedford; David Wang, Lexington, and Michael J. Steuck, North Reading, all of Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed Jun. 21, 1988, Ser. No. 209,307

Int. Cl.[5] B01L *67/00*

U.S. Cl. 210—490 18 Claims

15. A filtration material which comprises a hydrophobic, microporous membrane coated with a cross-linked, cationic polymer such that the ion exchange capacity of the coated membrane is provided by fixed, formal positive charge groups associated with the polymer, thereby providing a filtration material having both ionic and hydrophobic surface effects.

5,004,544

REACTION BONDED SILICON NITRIDE FILTRATION MEMBRANES

Robert A. Hay, Dudley; Craig A. Willkens, Sterling, and Arsenault, Normand P., Holden, all of Mass., assignors to Norton Company, Worcester, Mass.

Filed Nov. 13, 1989, Ser. No. 434,651

Int. Cl.[5] B01D *71/02*

U.S. Cl. 210—490 23 Claims

1. A supported filtration membrane comprising an effective separating layer consisting essentially of in situ formed silicon nitride having an effective pore diameter of about 1,000 nm or less and bonded to a porous support having substantially greater permeability than said effective separating layer.

5,004,545

CERAMIC FOAM FILTER APPARATUS

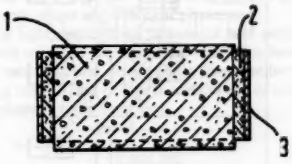
Hans-Peter Wahl, Velen; Rudolf Schlueter, Velen-Ramsdorf; Wolfgang P. Kaettliz, Borken, and Rolf Loos, Zuelpich, all of Fed. Rep. of Germany, assignors to Foseco International Limited, Birmingham, England

Filed Jun. 28, 1990, Ser. No. 544,945

Claims priority, application United Kingdom, Jul. 22, 1989, 8916839

Int. Cl.[5] C22B *9/02, 21/06*

U.S. Cl. 210—510.1 7 Claims



1. A ceramic foam filter having its peripheral surface surrounded by a gasket made from fibrous material and having metallic foil fixed to the gasket around the outer peripheral surface of the gasket.

5,004,546

PROCESS FOR MEASURING STABLE-TYPE GLYCATED HEMOGLOBIN IN A SAMPLE

Hiroaki Takahashi, Sagamihara; Haruo Okada, Tokyo; Katsuya Matsumoto, and Masuo Umino, both of Atsugi, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Division of Ser. No. 79,435, Jul. 30, 1987, Pat. No. 4,879,039. This application Sep. 1, 1989, Ser. No. 401,879

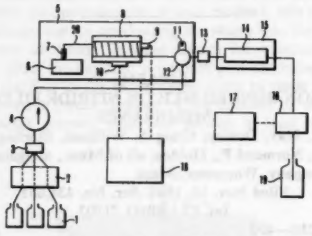
Claims priority, application Japan, Jul. 30, 1986, 61-177599

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—635 3 Claims

1. A process for measuring the amount of stable-type glycated hemoglobin in a sample using high performance liquid chromatography, comprising heating to a temperature of at least 45° C. a sample diluted with a hemolysis agent containing

a reagent comprising potassium phthalate for the removal of unstable-type glycated hemoglobin to achieve the removal of



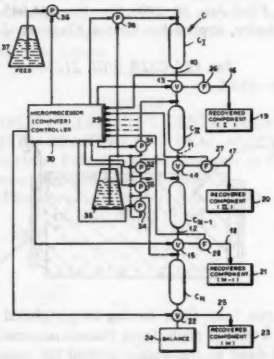
the unstable-type glycated hemoglobin, and analyzing the sample by high performance liquid chromatography.

5,004,547

METHOD AND APPARATUS FOR BIOAFFINITY SEPARATION

Hay Grunfeld; Noah Lotan, and Samuel Sideman, all of Haifa, Israel, assignors to Technion Research & Development Foundation Ltd., Haifa, Israel

Filed Jul. 5, 1989, Ser. No. 376,552
Claims priority, application Israel, Jul. 6, 1988, 87004
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—635 **12 Claims**



1. A method of bioaffinity separation for recovering simultaneously a plurality of bioactive components of a liquid feed which comprises the steps of:

(a) introducing a liquid feed containing a plurality of bioactive components into a first of a plurality of bioaffinity retention stages in cascade constituting respective column segments of a separation column packed with sorbent containing at least one biospecific substance so that said segments are loaded with said substance to different degrees along the length of the column;

(b) passing an eluant through said column segments in cascade to elute simultaneously and concurrently the components of said feed from the biospecific substance in each column segment;

(c) automatically connecting an outlet from each column segment to a respective collector upon passage of faster-eluting components of said feed to a successive column segment of the cascade to recover in each collector a slower-eluting component of said feed in an eluate;

(d) measuring the volume and flow rate of said eluate collected in each collector of a respective column segment and automatically feeding a corresponding makeup stream of said eluant to a successive column segment; and

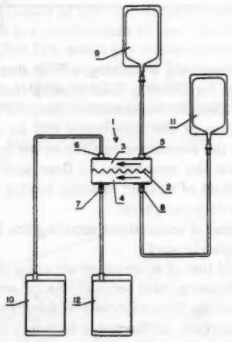
(e) controlling the automatic connection of said outlets from said column segments to the respective collectors with preprogrammed control of timing subsequent to the inception of elution by a computer for selective recovery of said components of said feed at the respective collectors.

5,004,548

METHOD AND APPARATUS FOR RINSING AND PRIMING AN EXCHANGER

Gerard Richalley, Lyons, and Jacques Burtin, Feyzin, both of France, assignors to Hospal Industrie, Cedex, France

Filed Dec. 9, 1988, Ser. No. 282,245
Claims priority, application France, Dec. 11, 1987, 87 17608
Int. Cl.[5] B01D *61/24, 63/00*
U.S. Cl. 210—646 **20 Claims**



1. A method for rinsing and priming an exchanger divided into first and second compartments by a semi-permeable membrane, the first compartment intended for circulating blood to be treated and the second compartment intended for circulating a purifying liquid, comprising the steps of:

(a) circulating a sterile solution through the first compartment to rinse the same;

(b) circulating a sterile solution through the second compartment to rinse the same; and

(c) depositing a protein film on at least one side of the semi-permeable membrane by circulating a sterile albumin solution through the first compartment.

5,004,549

METHOD FOR INHIBITING SCALE FORMATION USING CALCIUM HYPOCHLORITE COMPOSITIONS

Richard B. Wood, Bristol; Richard M. Mullins, Madison, and John A. Wojtowicz, Cheshire, all of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Oct. 10, 1989, Ser. No. 419,237
Int. Cl.[5] C02F *1/76*
U.S. Cl. 210—699 **5 Claims**

1. A method for inhibiting scale formation in a dispensing means for adding calcium hypochlorite to water to form an aqueous solution of calcium hypochlorite which comprises:

adding to the dispensing means a solid calcium hypochlorite composition comprising hydrated calcium hypochlorite and an alkali metal salt of phosphonobutane polycarboxylic acid having a concentration of at least about 0.005 percent by weight an available chlorine concentration of at least 50 percent by weight and a water content of at least 4 percent by weight, and contacting the solid calcium hypochlorite composition with water to form the aqueous solution of calcium hypochlorite.

5,004,550

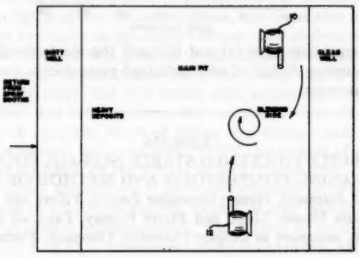
METHOD OF PAINT SLUDGE CONVERSION FOR DISPOSAL

John A. Beckman, Plymouth, Mich.; Shu-Jen Huang, Naperville, Ill., and Abdol R. Ebrat, Farmington, Mich., assignors to Nalco Chemical Company, Naperville, Ill.

Continuation-in-part of Ser. No. 318,308, Mar. 3, 1989, Pat. No. 4,929,382. This application Jan. 26, 1990, Ser. No. 470,388

Int. Cl.[5] C02F *11/14*

U.S. Cl. 210—710 8 Claims



1. A method for removal of sludge from a pit employed to collect paint wastes and residues generated in a wet spray booth operation, containing a mixture of accumulated sludge and water comprising the steps of:

(a) adding a detackification agent comprising:

(1) a water soluble cationic polymeric coagulant comprising a water soluble polymer formed by the reaction of epichlorohydrin, diethylamine and ammonia and having a number average molecular weight of about 50,000, and

(2) an aqueous colloidal silica sol having an average particle size between about 1 and 150 nm, the weight ratio of said polymeric coagulant to said silica sol being in the range of 1:5 to 5:1 to form a sludge mixture;

(b) admixing with at least a portion of the sludge mixture of step (a):

(2) sufficient caustic to raise the pH of the mixture to a value in the range of about 8.5 to 12,

(2) sufficient hydrocarbon oil to produce a total solids to liquid volume ratio of about 1:2 to 1:3, and

(3) a liquid emulsifier having a volume ratio to the oil of about 1:3 to 1:11;

(c) recirculating the resulting sludge composition in at least a portion of said pit until a pumpable liquid dispersion system is produced, said dispersion system being comprised of:

(1) an aqueous continuous phase, and

(2) a disperse system dispersed in such continuous phase comprised of particles and liquid droplets; and

(d) removing the dispersion from the pit.

5,004,551

CATALYTIC OXIDATION OF HAZARDOUS WASTES

Kerry L. Sublette, Tulsa, Okla., assignor to ABB Environmental Services Inc., Portland, Me.

Filed Jun. 22, 1990, Ser. No. 542,102

Int. Cl.[5] C02F *1/72*

U.S. Cl. 210—763 12 Claims

1. A process of treating water or solids contaminated with at least one chlorinated phenol, comprising:

oxidizing said at least one chlorinated phenol in the presence of an effective catalytic amount of at least one of a corrin- or porphyrin-metal complex.

5,004,552

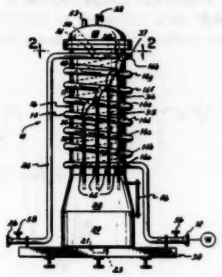
APPARATUS AND METHOD FOR SEPARATING WATER FROM CRUDE OIL

Ahmed M. Al-Yazdi, ADCO, P.O. Box 270, Abu Dhabi - VAE, United Arab Emirates

Filed Jun. 14, 1990, Ser. No. 537,695

Int. Cl.[5] B01D *21/26*

U.S. Cl. 210—789 24 Claims



14. The method of separating a heavy phase and a light phase in a fluid mixture, comprising,

passing the mixture through a vertical, spiral tubular coil, at a velocity sufficiently high that the heavy phase is concentrated toward the outside of the turns of the coil as the mixture flows around the spiral and the light phase is concentrated toward the inside of the turns,

withdrawing a fraction of the fluid from at least one upper turn of the coil, said fraction being withdrawn from the outside of said coil if the heavy phase is to be removed and from the inside of said coil if the light phase is to be removed,

conducting the withdrawn fraction downwardly to a settling tank,

permitting the withdrawn fraction to further separate into the heavy phase and the light phase, and

admitting light phase from the top of said settling tank to said coil adjacent the top of the coil if the heavy phase is to be removed, and heavy phase from the bottom of said settling tank to said coil adjacent the top of said coil if the light phase is to be removed.

5,004,553

WELL WORKING COMPOSITIONS, METHOD OF DECREASING THE SEEPAGE LOSS FROM SUCH COMPOSITIONS, AND ADDITIVE THEREFOR

Roy F. House, Houston, Tex.; Andree H. Wilkinson, and Jack C. Cowan, both of Lafayette, La., assignors to Venture Innovations, Inc., Lafayette, La.

Filed Oct. 16, 1989, Ser. No. 421,751

Int. Cl.[5] C09K *7/00*

U.S. Cl. 252—8.51 11 Claims

1. An additive for decreasing the seepage loss of fluid from a well working fluid in contact with a fluid permeable formation which comprises ground oat hulls wherein at least about 95% of the particles are less than about 590 microns, and at least about 90% of the particles are greater than about 74 microns.

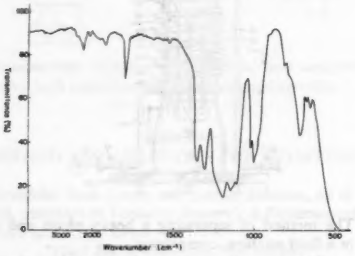
3. An additive for decreasing the seepage loss of fluid from a well working fluid in contact with a fluid permeable formulation which comprises a mixture of from about 50% to about 98% by weight ground oat hulls and from about 2% to about 50% by weight of a particulate material selected from the group consisting of ground corn cobs, hydrophobic organophilic water wettable cotton, ground citrus pulp, ground cotton burrs, and mixtures thereof; wherein the ground oat hulls has a particle size distribution such that at least 95% of the particles are less than about 590 microns and at least about 90% of the particles are greater than about 74 microns.

5,004,554

FLUORINE-CONTAINING POLYETHER AND LUBRICANT COMPRISING THE SAME

Takashi Tohzuka; Ikuo Yamamoto, both of Osaka, and Yoshihiko Misugi, Hyogo, all of Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 340,217, Apr. 19, 1989, abandoned. This application Jul. 24, 1990, Ser. No. 556,418
Claims priority, application Japan, Apr. 19, 1988, 53-97681
Int. Cl.[5] C10M *105/54*
U.S. Cl. 252—54.6 6 Claims



1. A fluorine-containing polyether of the formula:

$$R_f^1CF_2CF_2COOR_f^2 \quad (I)$$

or

$$R_f^2OCO—CF_2CF_2R'_f{}^1CF_2CF_2—COOR_f^2 \quad (II)$$

wherein R_f^1 and $R'_f{}^1$ are each a group containing a perfluoroalkyl polyether group, in which the perfluoroalkyl polyether group contains at least one repeating unit selected from the group consisting of a repeating unit of the formula:

$$—C_3F_6O— \quad (a)$$

a repeating unit of the formula:

$$—C_2F_4O— \quad (b)$$

and
a repeating unit of the formula:

$$—CF_2O— \quad (c)$$

provided that at least one of the repeating units (a) and (b) is contained and the total number of the repeating units (a), (b) and (c) is at least three, and R_f^2 is a fluorine-containing alkyl group or a fluorine-containing ether group.

5,004,555

HEAT CYCLE TREATMENT FOR IMPROVING THE PERFORMANCE OF PIEZOELECTRIC CERAMICS

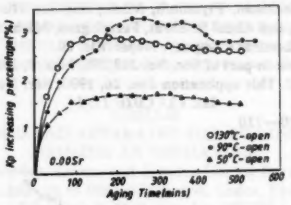
Syh Y. Cheng, Taichung, and Hong W. Wang, Kaohsung, both of Taiwan, assignors to Industrial Technology Research Institute, Taiwan

Filed Oct. 31, 1989, Ser. No. 429,704
Int. Cl.[5] C04B *35/49, 35/00*
U.S. Cl. 252—62.9 10 Claims

1. A process for the electromechanical coupling factor (Kp) of a polarized piezoelectric ceramics by thermal cycle treatment, said process comprising the steps of:

(a) keeping said polarized piezoelectric ceramics at a temperature of from 50° to 130° C. for from 10 to 60 minutes;

(b) cooling said polarized piezoelectric ceramics to room temperature rapidly;



(a) repeating steps (a) and (b) until the electromechanical coupling factor of said polarized piezoelectric ceramics saturates.

5,004,556

BUILT THICKENED STABLE NON-AQUEOUS CLEANING COMPOSITION AND METHOD OF USE

Michel Julemont, Heusy; Germaine Zocchi, Villers aux Tours; Nunzio Mineo, Liege, and Pierre Fonsny, Fays, all of Belgium, assignors to Colgate-Palmolive Company, Piscataway, N.J.

Continuation of Ser. No. 63,199, Jun. 17, 1987, Pat. No. 4,846,992. This application Apr. 21, 1989, Ser. No. 341,404
The portion of the term of this patent subsequent to Jul. 11, 2006, has been disclaimed.
Int. Cl.[5] C11D *3/075, 3/395, 3/12*
U.S. Cl. 252—99 15 Claims

1. A non-aqueous liquid fabric treating composition which comprises a non-aqueous liquid comprising a nonionic surfactant, fabric-treating solid particles selected from the group consisting of detergent builders, bleaching agents, antistatic agents, and mixtures thereof suspended in said non-aqueous liquid, and an organophilic clay, in an amount from about 0.2% to about 1% by weight, based on the weight of the composition, as a stabilizing agent to inhibit settling of the suspended particles, said organophilic clay comprising a swelling smectite clay modified with a nitrogen containing compound including at least one long chain hydrocarbon having from about 8 to about 22 carbon atoms.

5,004,557

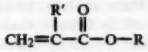
AQUEOUS LAUNDRY DETERGENT COMPOSITIONS CONTAINING ACRYLIC ACID POLYMERS

Madukkarai K. Nagarajan, Avon Lake; Fred J. Wherley, Middleburg Heights, and Jody W. Frimel, Vermillion, all of Ohio, assignors to The B. F. Goodrich Company, Brecksville, Ohio

Continuation-in-part of Ser. No. 30,317, Mar. 26, 1987, abandoned, which is a continuation-in-part of Ser. No. 766,330, Aug. 16, 1985, abandoned. This application Nov. 3, 1988, Ser. No. 266,760
Int. Cl.[5] C11D *3/37*
U.S. Cl. 252—174.24 8 Claims

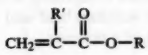
1. A liquid, non-enzymatic detergent composition devoid of boric acid or equivalent thereof that is clear or translucent, has pH or 8 to 10, is pourable at room temperature, and provides soil anti-redeposition function and improved cleaning performance comprising 10 to 40% of at least one surfactant selected from the group consisting of anionic sulfonate and sulphate surfactants, nonionic surfactants, cationic surfactants, amphoteric surfactants, and mixtures of such surfactants; 1 to 10% of at least one water-soluble sequester builder; and 0.1 to 2% of a water-soluble active agent having molecular weight in excess of about 100,000 selected from the group consisting of homopolymers of monounsaturated monocarboxylic and dicarboxylic acids of 3 to 5 carbon atoms and salts of such acids, copolymers thereof with 1 to 10% of one or more copolymerizable monomers, and mixtures of such homopolymers and copoly-

mers; said copolymerizable monomers are selected from alkyl acrylates represented by the following formula



where R^1 is selected from hydrogen, methyl group, and ethyl group; and R is selected from alkyl groups of 10 to 30 carbon atoms, alkyl groups of 1 to 9 carbon atoms, alkoxy groups of 1, haloalkyl groups of 1 to 9 carbon atoms, cryanoalkyl groups of 1 to 0 carbon atoms, cyanoalkyl groups of 1 to 9 carbon atoms; acrylic nitriles of 3 to 10 carbon atoms, acrylic amides with at least one hydrogen on the amide nitrogen with olefinic unsaturation in the alpha-beta position to the carbonyl carbon; α-olefins of 2 to 12 carbon atoms; dienes containing 4 to 10 carbon atoms; vinyl esters and allyl esters; vinyl aromatics; vinyl and allyl ethers and ketones; cyanoalkyl acrylates; vinyl chloride; vinylidene chloride; esters of maleic and fumaric acids; and mixtures thereof; and remainder to 100% by weight of water; amounts are based on the weight of said composition.

5. A liquid, non-enzymatic detergent composition devoid of boric acid or equivalent thereof, devoid of guar material, and devoid of dialkyl sulphosuccinate, that is clear or translucent, has pH of 8 to 10, is pourable at room temperature, and provides soil anti-redeposition function and improved cleaning performance comprising 10 to 40% of at least one surfactant selected from the group consisting of anionic sulfonate and sulphate surfactants, nonionic surfactants, cationic surfactants, amphoteric surfactants, and mixtures of such surfactants; 1 to 10% of at least one water-soluble sequester builder; and 0.1 to 2% of a water-soluble active agent having molecular weight in excess of about 100,000 selected from the group consisting of homopolymers of monounsaturated monocarboxylic and dicarboxylic acids of 3 to 5 carbon atoms and salts of such acids, copolymers thereof with 1 to 10% of one or more copolymerizable monomers, and mixtures of such homopolymers and copolymers; said copolymerizable monomers are selected from alkyl acrylates represented by the following formula



where R^1 is selected from hydrogen, methyl group, and ethyl group; and R is selected from alkyl groups of 10 to 30 carbon atoms, alkyl groups of 1 to 9 carbon atoms, haloalkyl groups of 1 to 9 carbon atoms, cyanoalkyl groups of 1 to 0 carbon atoms, cyanoalkyl groups of 1 to 9 carbon atoms; acrylic nitriles of 3 to 10 carbon atoms, acrylic amides with at least one hydrogen on the amide nitrogen with olefinic unsaturation in the alpha-beta position to the carbonyl carbon; α-olefins of 2 to 12 carbon atoms; dienes containing 4 to 10 carbon atoms; vinyl esters and allyl esters; vinyl aromatics; vinyl and allyl ethers and ketones; cyanoalkyl acrylates; vinyl chloride; vinylidene chloride; esters of maleic and fumaric acids; and mixtures thereof; and remainder to 100% of water; amounts are based on the weight of said composition.

5,004,558

SULFONE PEROXYCARBOXYLIC ACIDS

David R. Dyroff; Daniel P. Getman, both of St. Louis, and Joan K. Glascock, Creve Coeur, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 168,033, Mar. 3, 1988, Pat. No. 4,824,591, which is a division of Ser. No. 97,274, Sep. 17, 1987, Pat. No. 4,758,369, which is a continuation-in-part of Ser. No. 926,592, Nov. 3, 1986, abandoned. This application Dec. 8, 1988, Ser. No. 281,440

Int. Cl.[5] C11D *3/395, 7/38;* **C07C** *409/42*

U.S. Cl. 252—95 **48 Claims**

1. A bleaching detergent composition comprising a detergent surfactant and an effective amount of a compound represented by the formula:

wherein A and B are peroxycarboxylic acid compatible organic moieties bonded to the sulfur atom by a carbon atom, where only one of A and B at the same time contains from 1 to 4

groups bonded to carbon atoms.

5,004,559

POLYOXYALKYLENE-POLYSILOXANE BLOCK COPOLYMERS AS DEMULSIFIERS FOR WATER-CONTAINING OIL

Götz Koerner, and Dietmar Schaefer, both of Essen, Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

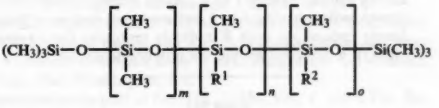
Division of Ser. No. 69,296, Jul. 2, 1987, abandoned. This application Nov. 16, 1988, Ser. No. 271,995

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1986, 3622571

Int. Cl.[5] B01D *17/05*

U.S. Cl. 252—345 **3 Claims**

1. A method of demulsifying water-containing crude oil emulsions, which comprises admixing the water-containing crude oil with an effective amount to demulsify of a polyoxyalkylene-polysiloxane mixed block polymer of the general formula



wherein

R^1 is alkyl with 6 to 28 carbon atoms;

R^2 is a polyether of the general formula

$$-M-(C_2H_4O)_x(C_3H_6O)_yR^3$$

wherein M is an alkyleneoxy group with up to 4 carbon atoms or an oxygen atom, R^3 is hydrogen, alkyl with 1 to 4 carbon atoms, acyloxy or trimethylsilyl, x and y are whole numbers, which are selected so that the molecular weight of the R^2 group is not greater than 1,000, the ratio by weight of oxyethylene to oxypropylene groups being 100:0 to 50:50,

m=0 to 20.

n=10 to 50 and

o=10 to 50.

5,004,560

BASIC POLYPYRRYLENEMETHINES AND SALTS THEREOF, AND A PROCESS FOR THEIR PREPARATION

Hermann Brüunling, Burghausen, and Richard Becker, Emmerting, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

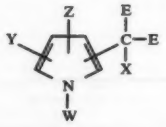
Filed Mar. 17, 1988, Ser. No. 169,474

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710657

Int. Cl.[5] C08F *26/06*; H01B *1/06*

U.S. Cl. 526—258 **20 Claims**

1. A process for the preparation of a polypyrrylenemethine polymer composition, or a salt thereof, comprising a polymer compound having conjugated double bonds and constructed from at least five five-membered heterocyclic rings wherein in each of said five-membered heterocyclic rings there is one nitrogen atom as the only heterocyclic atom, said five-membered heterocyclic rings being bonded to one another in pairs;



(III)

wherein,

X, Y and Z represent, independently of one another, identical or different monovalent radicals selected from the group consisting of hydrogen, an alkyl radical having from 1 to 18 carbon atoms, a phenyl radical and a phenyl radical which is substituted by a member selected from the group consisting of a halogen, a nitro-group, an alkyl group having 1 to 4 carbon atoms, a phenyl radial and a combination thereof, wherein Y and Z are bonded to the carbon atoms of the heterocyclic ring which are not substituted by groups of the formula C-X, Y and Z are further capable of being a substituent of the formula —COOR, wherein R represents a member selected from the group consisting of a hydrogen atom, a phenyl group and an alkyl group having from 1 to 18 carbon atoms;

and the radical of the formula—CXE_2 is in the 2-, 3-, 4- or 5-position on the pyrrole ring.

wherein,

W represents a substituent selected from the group consisting of a hydrogen atom, an alkyl group having from 1 to 18 carbon atoms and a phenyl radical; and

E represents the same or different monovalent radicals selected from the group consisting of a halogen atom, an alkoxy radical having 1 to 6 carbon atoms, and alkylsulfonate radical having 1 to 8 carbon atoms and an arylsulfonate radical, or both E radicals represent the oxygen atom of a carbonyl group, via polycondensation.

5,004,561

ELECTROMAGNETIC WAVE-SHIELDING THERMOPLASTIC RESIN COMPOSITION

Isao Nomura, and Kenichi Narita, both of Hiratsuka, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation of Ser. No. 6/948,141, Dec. 29, 1986, abandoned. This application Jan. 23, 1989, Ser. No. 300,210

Claims priority, application Japan, Mar. 31, 1986, 61-71052; Mar. 31, 1986, 61-71053; Sep. 9, 1986, 61-210681; Sep. 9, 1986, 61-210682; Sep. 9, 1986, 61-210683; Sep. 9, 1986, 61-210684; Sep. 9, 1986, 61-210685

Int. Cl.[5] H01B *1/06*

U.S. Cl. 252—511 **9 Claims**

1. An electromagnetic wave-shielding thermoplastic resin composition comprising

(A) 100 parts by weight of a thermoplastic resin selected from the group consisting of polypropylene resins, polystyrene resins, acrylonitrile/styrene/butadiene copolymer resin, polybutylene terephthalate resins, polyphenylene ether resins and linear aliphatic polyamide resins, wherein said linear aliphatic polyamides are polymers of monomers selected from the group consisting of combinations of diamines having 6 to 12 carbon atoms with dicarboxylic acids having 6 to 12 carbon atoms, lactams having 6 to 12 carbon atoms and aminocarboxylic acids having 6 to 12 carbon atoms,

(B) 100 to 200 parts by weight of electrically conductive glass fibers,

(C) 15 to 25 parts by weight of carbon black selected from the group consisting of thermal black channel black, acetylene black and furnace black, and

(D) 15 to 25 parts by weight of natural scale-like graphite.

5,004,562

LATEX/SOL OR GEL SYSTEMS

Charles L. Kissel, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Feb. 1, 1989, Ser. No. 305,451

Int. Cl.[5] B01J *13/00*

U.S. Cl. 252—518 **199 Claims**

1. A process for preparing a sol or gel composition containing at least 0.001 weight percent of at least one salt in the form of anions, cations, and colloidal salt particulates and prepared by heating an admixture comprising at least one nonaqueous solvent, at least one stabilizer and said salt, is subsequently admixed with a latex of a polymer.

5,004,563

ANTISTATIC TEXTILE COMPOSITIONS AND SOL/GEL/POLYMER COMPOSITIONS

Charles L. Kissel, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 305,451, Feb. 1, 1989. This application Apr. 28, 1989, Ser. No. 345,029

The portion of the term of this patent subsequent to Apr. 2, 2008, has been disclaimed.

Int. Cl.[5] H01B *1/06*

U.S. Cl. 252—518 **83 Claims**

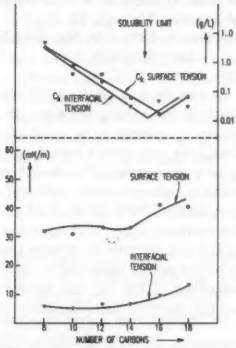
1. A textile composition comprising a textile material suffused with sufficient added salt from a sol or gel composition containing a nonaqueous solvent and said salt in the form of anions, cations and colloidal salt particulates to provide at least 5 percent greater electrical conductivity to said textile composition than that of said textile composition without added salt.

5,004,564

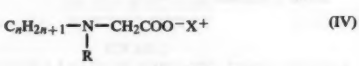
N-ALKYLGLYCAMINO COMPOUNDS, A PROCESS FOR PRODUCING THEM, AND THEIR USE

Heike Kelkenberg, Gladbeck, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Apr. 4, 1990, Ser. No. 503,960
Claims priority, application Fed. Rep. of Germany, May 9, 1989, 3915121
Int. Cl.[5] C11D *1/18, 3/32, 7/32;* C07C *229/12*
U.S. Cl. 252—546 6 Claims

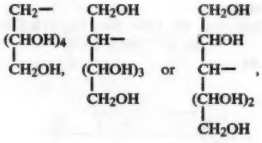


1. An N-Alkylglycamino compound of formula (IV):



(IV)

wherein n is 8–24,
R is



and x is Na, K, or H.

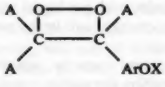
5,004,565

METHOD AND COMPOSITIONS PROVIDING ENHANCED CHEMILUMINESCENCE FROM 1,2-DIOXETANES

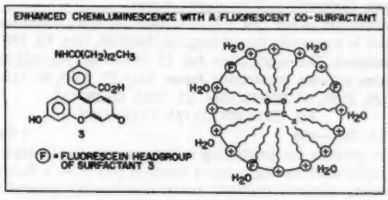
Arthur P. Schaap, Detroit, Mich., assignor to The Board of Governors of Wayne State University, Detroit, Mich.

Continuation-in-part of Ser. No. 887,139, Jul. 17, 1986. This application Jul. 27, 1988, Ser. No. 224,681
Int. Cl.[5] C08F *8/00;* C09K *3/00;* B01J *13/00*
U.S. Cl. 252—700 35 Claims

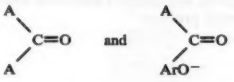
1. A composition which generates light upon triggering which comprises in admixture:
(a) a fluorescent compound; and
(b) a stable 1,2-dioxetane of the formula:



wherein ArOX represents an aryl group substituted with an X-oxy group which forms an unstable oxide intermediate 1,2-dioxetane compound when triggered to remove X by an activating agent so that the unstable 1,2-dioxetane



compound decomposes and releases electronic energy to form light and two carbonyl containing compounds of the formula:



wherein X is a chemically labile group which is removed by the activating agent to form the unstable oxide intermediate 1,2-dioxetane and wherein A are passive organic groups which allow the light to be produced wherein the stable 1,2-dioxetane is decomposed with the activating agent wherein the dioxetane and the fluorescent compound are provided in a closely spaced relationship in the presence of a surfactant, micelle, liposome, reversed micelle, microemulsion, film, including a monolayer, or polymer and wherein the fluorescent compound accepts the electronic energy generated upon decomposition of the unstable oxide intermediate and produces a more intense light than is produced by the triggering of the dioxetane alone.

5,004,566

PROCESS FOR FABRICATION OF LIPID MICROSTRUCTURES FROM DRY ORGANIC SOLVENT

Joel M. Schnur, Burke, Va.; Alan S. Rudolph, Bowie, and Mary A. Testoff, Greenbelt, both of Md., assignors to Geo-Centers, Inc., Fort Washington, Md.

Continuation-in-part of Ser. No. 11,838, Feb. 6, 1987, Pat. No. 4,877,501. This application Oct. 4, 1989, Ser. No. 416,915
Int. Cl.[5] C07F *9/00;* C11B *3/00*
U.S. Cl. 260—403 14 Claims

1. Process for forming tubular microstructures of selected shape and dimension from surfactants comprising the steps of:
selecting a lipid which self-assembles into a tubular microstructure;
selecting a lipid solvating organic solvent in which the tubules form;
removing essentially all water from the selected organic solvent;
dissolving the selected lipid in the dried organic solvent;
allowing the dissolved lipid to grow into the tubular microstructures in the dried organic solvent for a selected period of time and at a temperature below the melting point of the selected lipid.

5,004,567

PROCESS FOR PRODUCING FLUORINE-CONTAINING ALIPHATIC CARBOXYLIC ACIDS

Mitsuru Takahashi; Hideo Shuyama; Osamu Miyano, and Yukihiro Tsutsumi, all of Yamaguchi, Japan, assignors to Tosoh Corporation, Yamaguchi, Japan

Continuation of Ser. No. 110,017, May 27, 1986, abandoned, which is a continuation of Ser. No. 866,839, Oct. 13, 1987, abandoned. This application Jul. 22, 1988, Ser. No. 222,302

Claims priority, application Japan, May 27, 1985, 60-112219; Nov. 29, 1985, 60-269078; Dec. 27, 1985, 60-292438

Int. Cl.[5] C07C *51/15;* C11C *3/00*

U.S. Cl. 260—408 1 Claim

1. A process for producing a fluorine-containing aliphatic carboxylic acid having general formula (II) from a fluorine-containing aliphatic halogen compound having general formula (I) which process comprises the reaction of (I) at from 0°–100° C. with carbon dioxide in the presence of 1–10 equivalents of powdered zinc per equivalent of atoms of halogen other than fluorine in (I) in an organic solvent selected from the group consisting of dimethyl formamide, N-methylpyrrolidone, N,N-dimethylacetamide and dimethylsulfoxide followed by hydrolysis of the reaction product:

$$X—R_f—X' \quad (I)$$

$$Y—R_f—Y' \quad (II)$$

where, in formulae (I) and (II), X and X' independently denote a fluorine, chlorine, bromine or iodine atom, but X and X' do not both represent fluorine atoms at the same time, Y and Y' are carboxyl groups which substitute and combine at the combining site of X and X' in (I), and R_f is a saturated or unsaturated fluorine-containing straight or branched chain aliphatic group which contains 1 to 20 carbon atoms when either X or X' is a fluorine atom while otherwise R_f contains 3 to 20 carbon atoms, and when X or X' is a fluorine atom, the corresponding Y or Y' is also a fluorine atom, which process involves controlling the concentration of carbon dioxide in the organic solvent at a level of 0.3 to 5 mol/l.

5,004,568

CARBONYLATION OF ALLYLIC ETHERS TO ESTERS

Ronnie M. Hanes, Milford, and Jack Kwiatek, Cincinnati, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Oct. 3, 1985, Ser. No. 783,587

Int. Cl.[5] C09F *5/08*

U.S. Cl. 260—410 25 Claims

1. A method for the production of esters comprising reacting an allylic ether with carbon monoxide to obtain an ester, said reaction conducted in the presence of a catalytically effective amount of a halide of a Group VIII noble metal and a Group IB metal halide, said Group IB metal halide present in an amount sufficient to prevent said halide of a Group VIII noble metal from being converted into said Group VIII noble metal during said reaction.

5,004,569

PROCESS FOR THE PRODUCTION OF CARBOXYLIC ACID ESTERS

Helmut-Martin Meier, Ratingen; Klaus Kircher, Leverkusen, and Klaus Berg, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Continuation of Ser. No. 45,399, May 4, 1987, abandoned. This application Dec. 6, 1988, Ser. No. 281,887

Claims priority, application Fed. Rep. of Germany, May 14, 1986, 3616137

Int. Cl.[5] C09F *5/08;* C11C *3/00, 3/02*

U.S. Cl. 260—410.6 2 Claims

1. A process for the production of a carboxylic acid ester, which comprises reacting a carboxylic acid with an alcohol in the presence, as an esterification catalyst, of a neutral phosphite compound which is a phosphorous acid ester of at least one monoalcohol containing at lease one oxetane group and at least one polyhydroxy compound selected from the group consisting of an aliphatic polyalcohol free of oxetane groups, a cycloaliphatic polyalcohol free of oxetane groups and a polyhydroxyaryl compound free of oxetane groups.

5,004,570

OIL BLEACHING METHOD AND COMPOSITION FOR SAME

David D. Brooks, Crystal Lake; Shirley A. Brophy, Ingleside, and George R. Goss, Quincy, all of Ill., assignors to Oil-Dri Corporation of America, Chicago, Ill.

Filed Dec. 5, 1988, Ser. No. 280,127

Int. Cl.[5] C11B *3/06*

U.S. Cl. 260—427 11 Claims

1. A method of bleaching a triglyceride oil having color impurities, the method comprising the steps of:

producing a slurry by combining in a suitable vessel the oil, a neutral bleaching clay and a chelating polycarboxylic acid having an even number of carboxyl groups, the carboxyl groups being paired and the carboxyl groups in each pair being available to form an eclipsed conformation;

maintaining the resulting slurry with agitation at an elevated temperature and at a pressure no greater than atmospheric pressure for a time period sufficient to reduce the amount of color impurities of the oil, the elevated temperature being below the thermal decomposition temperature of the oil;

recovering a bleached oil from the slurry; and

producing a spent bleaching composition that resists spontaneous combustion.

5,004,571

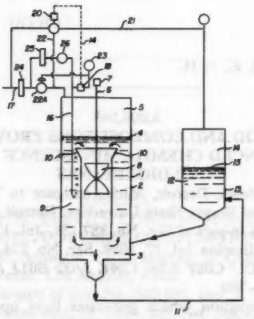
LIQUID LEVEL CONTROL IN GAS-LIQUID MIXING OPERATIONS

Lawrence M. Litz, Pleasantville, N.Y.; Mark K. Weise, North Haledon, N.J., and David A. Haid, Westport, Conn., assignors to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.

Filed Mar. 30, 1990, Ser. No. 516,775

Int. Cl.[5] B01F *3/04*

U.S. Cl. 261—91 13 Claims



1. In a process for mixing a gas and a liquid in a mixing vessel having a hollow draft tube with an axial flow, down-pumping impeller means positioned therein for vortex development and the ingestion of gas from an overhead space within the mixing vessel into the body of liquid therein, said gas-liquid mixing operation resulting in liquid volume changes within the mixing vessel, the improvement comprising:

(a) maintaining a secondary volume capacity, within or external to said body of liquid within the mixing vessel, for the accommodation of said liquid volume changes during

the course of the gas-liquid mixing operation, with communication being provided between said body of liquid in the mixing vessel and said secondary volume capacity so that liquid can be passed from said body of liquid in the mixing vessel to said secondary volume capacity;

(b) monitoring the liquid level of said body of liquid in the mixing vessel throughout the course of the gas-liquid mixing operation; and

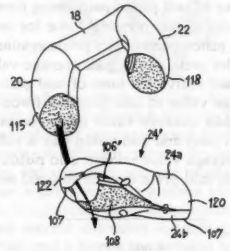
(c) modulating the pressure in the gas space of said secondary volume capacity in response to changes in the liquid level that occur with respect to said body of liquid in the mixing vessel so as to maintain the desired liquid level of the body of liquid for vortex development and gas ingestion while the total volume of liquid is changing over the course of said gas-liquid mixing operation, whereby the secondary volume capacity is effectively utilized to accommodate volume changes that occur throughout the gas-liquid mixing operation so that the desired liquid level can be maintained for proper vortex development and gas ingestion from the overhead gas space in said mixing vessel.

5,004,572

METHOD OF PRODUCING SKIN TUBE FOR ANNULAR FOAM PRODUCT, AND ASSEMBLY OF THE SKIN TUBE AND CORE STRUCTURE

Kazunori Kurimoto, Konan, Japan, assignor to Tokai Chemical Industries, Ltd., Aichi, Japan

Filed Nov. 17, 1988, Ser. No. 272,411
Claims priority, application Japan, Nov. 20, 1987, 62-294469
Int. Cl.[5] B29C *67/22*
U.S. Cl. 264—46.6 **16 Claims**



1. A method of preparing an annular skin tube for a foam product, which has an opening defined by an annular inner periphery thereof, comprising steps of:

preparing a plurality of tubular skins each having at least one linearly joined edge portion;

joining together said plurality of tubular skins end to end, at opposite ends thereof except at least one set of unjoined ends of at least one selected pair of adjacent tubular skins, so as to prepare an intermediate skin tube such that a nominal outside of said intermediate skin tube is exposed;

providing an unjoined portion in an outer periphery of said intermediate skin tube, adjacent to said at least one set of unjoined ends; and

joining the unjoined ends of each of said at least one selected pair of the adjacent tubular skins of said intermediate skin tube, while end portions including said unjoined ends are superposed on each other and are passed through said unjoined portion outwardly of said intermediate skin tube such that one of said end portions is turned inside out; and

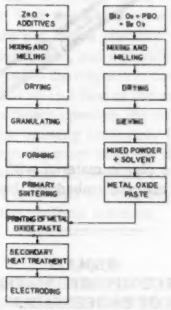
passing said one of the end portions back through said unjoined portion inwardly to expose a nominal outside thereof, whereby said intermediate skin tube is formed into said annular skin tube.

5,004,573

FABRICATION METHOD FOR HIGH VOLTAGE ZINC OXIDE VARISTOR

Myung H. Oh; Kyung J. Lee; In J. Chung; Nam Y. Lee, and Myung S. Kim, all of Seoul, Rep. of Korea, assignors to Korea Institute of Science and Technology, Rep. of Korea

Filed Nov. 2, 1989, Ser. No. 430,463
Int. Cl.[5] C04B *41/81*
U.S. Cl. 264—61 **9 Claims**



1. A method for fabricating the high voltage zinc oxide varistor having a high breakdown voltage and good voltage-current characteristics comprising;

preparing a zinc oxide mixture comprising zinc oxide and a further oxide selected from the group consisting of antimony oxide, cobalt oxide, manganese oxide, chromium oxide, and mixtures thereof;

sintering the zinc oxide mixture at a temperature of 1200 to 1350° C. under conditions and for a period of time effective to form a primary sintered varistor body;

coating the surface of the primary sintered varistor body with a metal oxide past comprising bismuth oxide as a major ingredient and a second ingredient selected from the group consisting of B_2O_3, zinc oxide or mixtures thereof in an amount effective to form a coated primary sintered varistor body; and

heat treating the coated primary sintered varistor body at a temperature of 1000 to 1200° C. under conditions and for a period of time effective to print the metal oxide paste on the surface of the primary sintered body and diffuse the bismuth oxide to the grain boundaries of the zinc oxide in the sintered varistor body to obtain said high voltage zinc oxide varistor.

5,004,574

METHOD OF MAKING A COMPOSITE STRUCTURAL ELEMENT

Hartley Sandt, 2425 Dogwood La., Orange Park, Fla. 32073

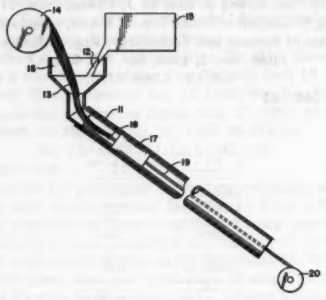
Filed Dec. 28, 1987, Ser. No. 138,151
Int. Cl.[5] B29C *39/10*
U.S. Cl. 264—101 **15 Claims**

1. A process for preparing an elongated structural element comprising the steps of:

(1) preparing a hollow external solid walled casing of a tubular material being an integral part of the structural element;

(2) filling the entire interior of the external casing with a plastic material in liquid form while generally simultaneously distributing throughout the plastic material a plurality of elongated continuous strands of fiber rein-

forcement material substantially parallel to each other and extending lengthwise of the casing; and



(3) solidifying the plastic material with the strands of fiber reinforcement material embedded therein.

5,004,575

PREPARING COMPOSITE MATERIALS FROM MATRICES OF PROCESSABLE AROMATIC POLYIMIDE THERMOPLASTIC BLENDS

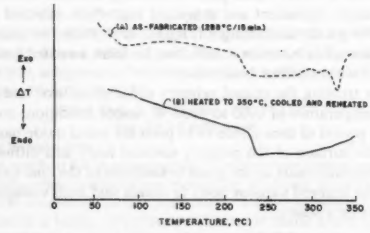
Norman J. Johnston, Newport News; Terry L. St. Clair, Poquoson; Robert M. Baucom, Newport News, and John R. Gleason, Hampton, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 105,846, Oct. 8, 1987, abandoned.

Filed Oct. 21, 1988, Ser. No. 262,268

Int. Cl.[5] B29C *67/14*; C08G *73/14*

U.S. Cl. 264—136 **4 Claims**



1. A process for preparing a composite material, which process comprises blending an insoluble aromatic polyimide powder with an aromatic polyamic acid solution,

said blending resulting in a slurry,

said aromatic polyamic acid solution comprising a first aromatic polyamic acid dissolved in a solvent selected from the group consisting of aprotic solvents, protic solvents and ether solvents, wherein a ratio of said polyimide powder to said first polyamic acid is between 1:10 and 10:1 by weight,

which process further comprises preparing a prepreg from substrate fibers and said slurry, by impregnating said substrate fibers with said slurry,

which process further comprises removing said solvent from said prepreg, wherein said polyamic acid acts to bind said polyimide powder to said substrate fibers, and

which process finally comprises consolidating said prepreg into a finished composite material by the addition of heat, wherein both said polyamic acid and said polyimide powder comprise a matrix for said finished composite.

5,004,576

PROCESS AND APPARATUS FOR MONITORING PRESSING FORCES IN A TABLET PRESS

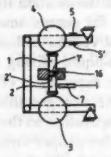
Juergen Hinzpeter, Schwarzenbek, and Hans-Dieter Gruedelbach, Moelln, both of Fed. Rep. of Germany, assignors to Wilhelm Fette GmbH, Schwarzenbek, Fed. Rep. of Germany

Filed May 3, 1989, Ser. No. 347,335

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1988, 3823417

Int. Cl.[5] B29C *43/02*

U.S. Cl. 264—40.5 **8 Claims**



1. In a process for monitoring a pressing force acting successively and periodically on each of a plurality of piston pairs of a tablet press in succession, each of said piston pairs consisting of an upper and lower piston acting pairwise in said piston pair, in which an average value of said pressing force formed from a plurality of successive measurement results of said pressing force is compared with two adjustable tolerance bounds for said average value, said average value of said pressing force being further correlated with two adjustable individual value limits which follow the course of said average value or are fixed, maxima of said pressing force on said individual ones of said piston pairs being compared with said adjustable individual value limits, the improvement wherein a piston pair average value of said pressing force is associated with individual ones of said piston pairs, said piston pair average values for each individual one of said piston pairs being formed from the measurement results of said pressing force for said each individual one of said piston pairs over a predetermined number of cycles of said tablet press, piston pair average value limits are associated with said individual ones of said piston pairs, said piston pair average value of said pressing force is compared with said piston pair average value limits for said individual ones of said piston pairs and said piston pair is indicated, when said piston pair average value exceeds said piston pair average value limits so that said press may be stopped and said piston pair examined.

5,004,577

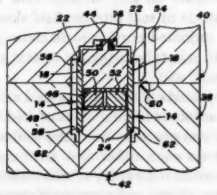
FRAME AND MAGNET ASSEMBLY FOR A DYNAMOELECTRIC MACHINE

Robert W. Ward, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 447,541, Dec. 6, 1989. This application May 25, 1990, Ser. No. 528,407

Int. Cl.[5] H22K *21/36*; B29C *45/14*; B32B *1/08*

U.S. Cl. 264—112 **3 Claims**



1. A method of manufacturing a frame and permanent magnet assembly for a dynamoelectric machine where a permanent magnet is carried by and secured to the frame, and wherein the frame is comprised of iron powder particles that are bound

together by a thermoplastic material, the steps comprising, molding said iron powder particles that are coated with a thermoplastic material to a permanent magnet in such a manner that the molded coated iron powder particles form a frame that is interlocked to said permanent magnet.

5,004,578

PROCESS AND APPARATUS FOR PRODUCING HOLLOW BODIES OF THERMOPLASTIC MATERIAL

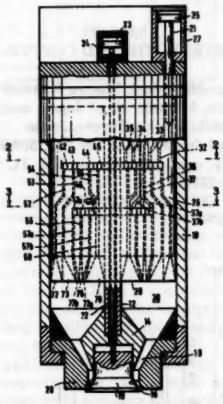
Otto Eiselen, Königswinter, Fed. Rep. of Germany, assignor to Drupp Kautex Maschinenbau GmbH, Bonn, Fed. Rep. of Germany

Filed Jun. 30, 1989, Ser. No. 375,167

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1988, 3822524

Int. Cl.[5] B29C *49/04, 49/22*

U.S. Cl. 264—514 **12 Claims**



1. In a process for producing hollow bodies from thermoplastic material, the wall of which is in the form of a laminate including a plurality of interconnected layers of at least two plastic materials of different nature, by means of extrusion blow molding, the step of producing tubular preforms whose wall comprises a corresponding number of layers in an intermittent mode of operation using an extrusion unit including at least first and second extruders extruding the at least two plastic materials and a common extrusion head which is connected to the first and second extruders and which includes an annular storage chamber for receiving a preform laminate, an annular piston positioned for reciprocation in at least part of the storage chamber for emptying the storage chamber and an extrusion opening on a side of the storage chamber opposite the annular piston and through which the preform laminate is extruded by the annular piston emptying the chamber to form the tubular preforms, wherein all flows of the plastic materials which pass into the extrusion head for forming the individual layers of the laminate pass into and are guided through the annular piston and are each put therein into an annular cross-sectional shape, and wherein at least a plurality of flows of different material leave the annular piston at its side facing towards the extrusion opening flowing individually out of an end face of the annular piston directly into the storage chamber and combine in the storage chamber only after flowing separately beyond the end face of the piston to form the preform laminate.

6. Apparatus for producing hollow bodies from plastic material comprising a wall in the form of a laminate formed by a plurality of interconnected layers of at least first and second plastic materials of different natures by means of extrusion blow molding, said apparatus comprising an extrusion unit including at least first and second extruders extruding the at least first and second different plastic materials and a common extrusion head which is connected to the first and second extruders and which includes a storage chamber for receiving a preform laminate, an annular piston positioned for reciprocating in at least part of the storage chamber for emptying of the storage chamber and an annular extrusion opening on a side of the storage chamber opposite the piston for extrusion of the preform laminate by the annular piston during the emptying of the storage chamber, wherein the annular piston has therewithin a plurality of duct systems comprising feed ducts for receiving flows of the plastic materials from the at least first and second extruders, distributor ducts which communicate with the respective feed ducts and in which the respective flows of material are put into a plurality of flows of annular cross-sectional configuration, and a plurality of annular outlets which communicate with the respective distributor ducts, each outlet being located at an end face of the annular piston which faces towards the extrusion opening, the outlets at said end face of the annular piston opening separately from each other directly into the storage chamber whereby at least a plurality of separate annular flows pass through the outlets and combine in the storage chamber only after flowing beyond the end face of the piston to form the preform laminate.

5,004,579

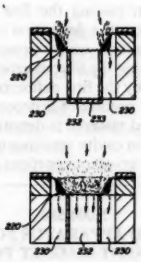
METHODS AND APPARATUS FOR SELECTIVE PLACEMENT OF FIBROUS MATERIAL IN FORMED FIBROUS ARTICLES

Martin Wisliński, Edison; Roger Bergquist, Ringoes; Manfred Schroeder, Freehold; Theodore Weir, Mahwah; Matthew Monetti, Howell, and Paul Fung, South River, all of N.J., assignors to McNeil-PPC-Inc., Milltown, N.J.

Filed May 26, 1989, Ser. No. 359,011

Int. Cl.[5] D04H *1/72;* B27N *3/04*

U.S. Cl. 264—517 **27 Claims**



1. Apparatus for forming fibrous articles having at least two distinct portions of fibrous materials, comprising:

(a) first means for defiberizing a first fibrous material;

(b) duct means for entraining and transporting the defiberized first fibrous material to a first airlaying location;

(c) second means for defiberizing a second fibrous material;

(d) duct means for entraining and transporting the defiberized second fibrous material to a second airlaying location;

(e) airlaying apparatus, comprising:

(i) first forming chamber in communication with a duct means, creating a first airlaying location;

(ii) second forming chamber in communication with a duct means, creating a second airlaying location;

(iii) cavity transport means, having an interior section;

(iv) a plurality of deposition cavities disposed on the cavity transport means, at least a portion of each of the deposition cavities comprising a foraminous surface;

(v) vacuum chamber means, disposed in the interior section of the cavity transport means, in communication with a least a portion of the foraminous surface of a deposition cavity;

(vi) air handling means for creating a controlled pressure

differential between the airlaying locations and the interior section of the cavity transport means; and

(f) ejection means for removing a fibrous article from the airlaying apparatus

whereby the first defiberized material is deposited in at least a portion of a deposition cavity and the second defiberized material is deposited in at least a portion of the same deposition cavity resulting in an article having at least two distinct portions of fibrous materials having a greater proportion of one of said fibrous materials in one lateral planar portion of said article than in another lateral co-planar portion.

15. Deposition cavity apparatus for forming an airlaid article, in communication with a duct carrying a stream of air-entrained fibrous material to an airlaying location, comprising: a frame portion in sealing engagement with the duct; and a foraminous portion, foramen in said foraminous portion being of a size sufficient to retain the air-entrained fibrous materials, whereby an airlaid article is formed in the region of the foraminous portion and further comprising apparatus for creating a negative pressure in a first portion of a deposition cavity and a positive pressure in a second portion of a deposition cavity.

16. A method of forming fibrous articles having at least two distinct portions of fibrous materials, comprising the steps of:

(a) defiberizing a first fibrous material;

(b) entraining and transporting the defiberized first fibrous material to a first airlaying location;

(c) defiberizing a second fibrous material;

(d) entraining and transporting the defiberized second fibrous material to a second airlaying location;

(e) airlaying the fibrous materials by transporting the first fibrous material to a first forming chamber in communication with a duct means, creating a first airlaying location; transporting the second fibrous materials to a second forming chamber in communication with a duct means, creating a second airlaying location; creating a controlled pressure differential between the airlaying locations and a vacuum chamber; passing the first and second air entrained fibers through a deposition cavity, at least a portion of the deposition cavity comprising a foraminous surface; and ejecting the fibrous article from the airlaying apparatus, whereby the first defiberized material is deposited in at least a portion of a deposition cavity and the second defiberized material is deposited in at least a portion of a deposition cavity resulting in an article having at least two distinct co-planar portions of fibrous materials.

5,004,580

METHOD AND APPARATUS FOR PACKING PERMANENT MAGNET POWDER

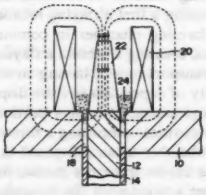
Yoshio Matsuo; Hirofumi Nakano, both of Toyohashi; Masakuni Kamiya, Hamamatsu, and Kezuo Matsui, Toyohashi, all of Japan, assignors to Fuji Electrochemcial Co. Ltd., Tokyo, Japan

Filed Apr. 13, 1990, Ser. No. 508,421

Claims priority, application Japan, Apr. 15, 1989, 1-95916; Apr. 24, 1989, 1-104056

Int. Cl.[5] B22F *1/00*

U.S. Cl. 419—65 **10 Claims**



1. A method of packing a permanent magnet powder comprising:

providing a mold having a cylindrical molding space with a central axis and an opening;

providing a solenoid coil having a central axis near said opening of said cylindrical molding space so that said central axis of said solenoid coil substantially coincides with said central axis of said mold space;

providing a magnetic pole means extending along said central axis of said solenoid coil;

supplying a permanent magnet powder above said opening of said molding space; and

applying an alternating current magnetic field by said solenoid coil passing through at least part of said mold and molding space for packing said permanent magnet powder into said molding space.

5,004,581

DISPERSION STRENGTHENED COPPER-BASE ALLOY FOR OVERLAY

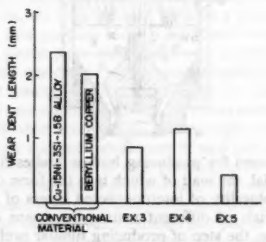
Soya Takagi; Kazuhiko Mori; Minoru Kawasaki, all of Toyota, and Shinji Kato, Miyoshi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 30, 1990, Ser. No. 559,941

Claims priority, application Japan, Jul. 31, 1989, 1-196784; Aug. 30, 1989, 1-221613

Int. Cl.[5] C22C *9/02, 9/04/9/06, 9/08*

U.S. Cl. 420—487 **11 Claims**



1. A dispersion strengthened copper-base alloy for a wear-resistant overlay formed on a metal substrate consisting essentially of, by weight %,

Ni: 5 to 30%;

B: 0.5 to 3%;

Si: 1 to 5%;

Fe: 4 to 30%;

at least one metal selected from the group consisting of 3 to 15% of Sn and 3 to 30% of Zn; and

the remainder being Cu and unavoidable impurities, and having a structure in which particles of boride and silicide of the Fe-Ni system are dispersed in a Cu-base matrix and Cu-base primary crystals contain Sn and/or Zn in a solid solution state.

5. A dispersion strengthened copper-base alloy (for a wear-resistant overlay formed on a metal substrate) consisting essentially of, by weight %,

Ni: 5 to 30%;

B: 0.5 to 3%;

Si: 1 to 5%;

Fe: 4 to 30%;

Pb: 2 to 20%; and

the remainder being Cu and unavoidable impurities, and having a structure in which particles of boride and silicide are dispersed in a Cu-base matrix, and nonsoluble Pb particles are uniformly dispersed between Cu-base α phase dendrites.

5,004,582

BIOCHEMICAL ANALYSIS APPARATUS

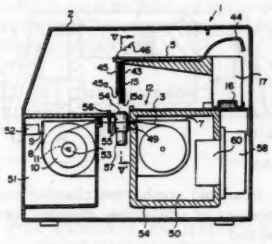
Yukihide Miyata; Hideo Ishizaka, both of Kanagawa; Yoshio Saito, Saitama, and Takashi Koizumi, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 14, 1988, Ser. No. 219,027

Claims priority, application Japan, Jul. 15, 1987, 62-176563; Feb. 10, 1988, 63-29842; Mar. 19, 1988, 63-66354

Int. Cl.[5] G01N *33/48, 33/50, 35/04*

U.S. Cl. 422—56 **13 Claims**



1. A biochemical analysis apparatus comprising:

i) a sample accommodating means for accommodating a liquid sample,

ii) a test film accommodating means for accommodating a plurality of long test films, each of said long test film containing a reagent which reacts with said liquid sample to give rise to a change in optical density, and controlling an unused length of each of said long test films at a predetermined temperature and humidity so that deterioration of each of said long test films is controlled,

iii) a test film conveyance means for sequentially pulling out each of said long test films accommodated in said test film accommodating means,

iv) a sample application means for taking up said liquid sample accommodated in said sample accommodating means and sequentially applying a predetermined amount of said liquid sample onto a portion of each of said long test films at the position to which each of said long test films has been pulled out sequentially of said test film accommodating means,

v) an incubator for maintaining the portion of each of said long test films, having said predetermined amount of said liquid sample applied thereon by said sample application means, at a predetermined temperature for a predetermined time, and

vi) a detection means for irradiating light to said portion of each of said long test films, having said predetermined amount of said liquid sample applied thereon, and measuring the optical density given rise to by a reagent-sample reaction during or after the passage of said predetermined time.

5,004,583

UNIVERSAL SENSOR CARTRIDGE FOR USE WITH A UNIVERSAL ANALYZER FOR SENSING COMPONENTS IN A MULTICOMPONENT FLUID

Vinodhini Guruswamy, and Donald A. Elliott, both of Bethesda, Md., assignors to MedTest Systems, Inc., College Park, Md.

Continuation-in-part of Ser. No. 8,554, Jan. 29, 1987, Pat. No. 4,762,594. This application Aug. 8, 1988, Ser. No. 229,503

Int. Cl.[5] G01N *21/27, 21/63, 27/333*

U.S. Cl. 422—58 **16 Claims**

1. A re-useable cartridge for facilitating analytical measurement of a solution, comprising:

(a) a housing,

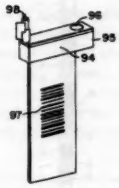
(b) a chamber having a cross-section for containing a predefined volume of solution, said chamber having a first end and a second end being disposed within said housing,

(c) an inlet port in fluid communication with said chamber, said port being located proximate to said first chamber end,

(d) a waste reservoir of preselected volume in fluid communication with said chamber and located proximate to said second chamber end,

(e) inlet ports for introducing fluids directly into said chamber,

(f) means for positively forcing fluid in said chamber to flow out of said chamber and into said reservoir,



(g) means for substantially preventing fluid back-flow from said reservoir to said chamber,

(h) sensor elements having cross-sections disposed in said housing and interfacing with said chamber at a preselected location between said first end and said fluid backflow preventing means; and

(i) means for conveying signals generated by said sensor elements through and out of said housing.

5,004,584

DEVICE FOR TESTING FLUIDS

Gerard A. Rayman, 10 Sternes Way, Stapleford, Cambridge, United Kingdom

Filed Jun. 23, 1988, Ser. No. 210,228

Claims priority, application United Kingdom, Jun. 26, 1987, 8714979; Mar. 8, 1988, 8805431

Int. Cl.[5] G01N *31/22*

U.S. Cl. 422—58 **10 Claims**

1. A device for testing a fluid by a reaction of a component of the fluid with a regeant carried by a test probe, the device comprising:

a sleeve member having a first and second end;

a first chamber formed at the first end of the sleeve member, the chamber being adapted to be filled with the fluid by capillary action when the first end of the sleeve member is immersed in a source of the fluid;

a probe member adapted to be inserted into the sleeve member and axially movably received in the sleeve member;

a fluid testing surface on the probe member, the fluid testing surface being adapted to be inserted into the first chamber to react with the fluid in the first chamber; and

a second chamber formed in the sleeve member, the second chamber being separate from the first chamber and being adapted to remove fluid from the fluid testing surface on the probe member as the probe member is moved axially through the second chamber.

5,004,585

COLORIMETRIC DETECTOR TUBE

Rainer Bommer, Lübeck, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengsellschaft, Lübeck, Fed. Rep. of Germany

Filed Sep. 1, 1988, Ser. No. 239,318

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1987, 3729079

Int. Cl.[5] G01N *31/22*

U.S. Cl. 422—58 5 Claims

1. A colorimetric detector tube for detecting hydrogen, the detector tube comprising:

a tubular housing having first and second openable ends which can be opened to allow a stream of a gas to be detected to pass therethrough;

a porous charge disposed in said housing between said ends;

a pretreatment substance arranged on said charge so as to define a plurality of separate pretreatment regions arranged sequentially along the length of said charge so as to be in shaped relationship to each other;

indicator means arranged on saic charge so as to define a plurality of indicating regions alternating with said pretreatment regions;

said pretreatment substance in each of said pretreatments regions being selected to coact with the gas to form a product which reacts with said indicator means to form a stepwise coloration in one or more of said indicating regions depending upon the amount of the gas passing into the tube whereby an overall indication of the detector tube is determined by an addition of the individual linear colorations in the respective indicating regions;

said charge being a granular carrier substrate and said pretreatment substance being impregated into said carrier substrate in said pretreatment regions;

said indicator means being impregnated into said carrier substrate in said indicating regions; and

said pretreatment substance being palladium and said indicator means including $Mg(ClO_4)_2$.

5,004,586

GAS GENERATING APPARATUS FOR INFLATING AIR BAG

Minoru Hayashi; Koichi Kobari; Kimiharu Sato, and Kishimoto Junichi, all of Fukushima, Japan, assignors to Nippon Koki Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1988, Ser. No. 150,029

Claims priority, application Japan, Feb. 10, 1987, 62-29339

Int. Cl.[5] B60R *21/30*

U.S. Cl. 422—164 15 Claims

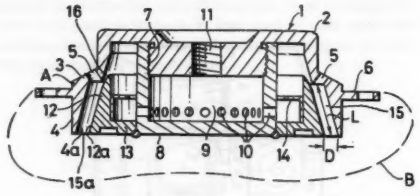
1. A gas generating apparatus for inflating an air bag, comprising:

a housing body (1) having opposite sides, one of which opens toward an air bag when a portion (6) of the body is connected to such air bag;

a combustion chamber (9) formed centrally within said housing body, wherein high-pressure gas is generated upon combustion of a gas generating agent contained within the body;

the housing body having a partition (12) which forms a mixing chamber (15) in ring-like configuration concentrically disposed so as to be spaced apart from a discharge (15*a*) opening of said housing body by a desired interval, said combustion chamber communicating with said mixing chamber whereby said high-pressure gas from said combustion chamber is introduced into said mixing chamber;

a nozzle (16) of ring-like configuration provided wherein said housing body for ejecting said high-pressure gas



flowing from said combustion chamber toward an entrance opening of said mixing chamber formed by said partition; and

an air intake means (5) formed in said housing body in close proximity to said nozzle and opening from the side of the housing body opposite from such air bag, whereby said high pressure gas ejected by said nozzle causes air to be drawn through said air intake means into said mixing chamber and mixed therein with said high-pressure combustion gas for cooling thereof.

5,004,587

APPARATUS AND METHOD FOR OZONE PRODUCTION

Ernest J. Tacchi, Mobile, Ala., assignor to Aqua Pura Group, Madison, Miss.

Filed Feb. 5, 1990, Ser. No. 475,432

Int. Cl.[5] B01J *19/08*

U.S. Cl. 422—186.19 14 Claims

1. An apparatus for producing ozone which comprises,

a vessel containing a fluid counter-electrode, said counter-electrode being in communication with the external surface of a flexible dielectric tubing which forms a corona discharge chamber, said corona discharge chamber having a passageway therethrough for acceptance of a flexible high tension electrode means and for acceptance of dry oxygen hearing gas; .

a transformer having one end of its secondary winding ohmically connected to said flexible high tension electrode means and the ground potential end of said secondary winding is electrolytically connected to said fluid counter-electrode and the primary winding of said high voltage

transformer is ohmically connected to a source of current for driving said transformer;

a power source controller means ohmically connected to said transformer and said corona discharge chamber whereby said power source controller means modulates the amplitude, duration, and interval of power application to said primary winding of said transformer and said corona discharge chamber; and

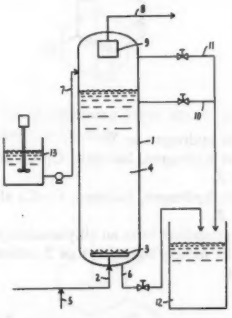
a heat exchanger means having an electrically conductive metallic member forming a reservoir through which a coolant fluid flows, said metallic member being ohmically connected to ground potential and said metallic member is immersed in said fluid counter-electrode to form an electrolytic junction therewith.

5,004,588

PROCESS FOR REMOVAL OF HYDROGEN SULFIDE FROM GASEOUS STREAM

Scott P. Nisula, Alameda, and Christopher P. O'Callaghan, San Rafael, Gerald A. Bogaczyk, Alta Loma, all of Calif., assignors to Chevron Research & Technology Company, San Francisco, Calif.

Continuation of Ser. No. 144,409, Jan. 15, 1980, abandoned.
Filed Jun. 1, 1990, Ser. No. 530,446
Int. Cl.[5] C01B *17/16, 17/02, 31/20*
U.S. Cl. 423—226 **12 Claims**



1. A process for removing hydrogen sulfide from a gaseous stream which comprises contacting said hydrogen sulfide containing gaseous stream with an aqueous solution comprising a water soluble oxidized polyvalent metal chelate catalyst to convert the hydrogen sulfide to particulate elemental sulfur and reduce the polyvalent metal chelate catalyst, said contacting taking place in the presence of sufficient oxygen for oxidizing the reduced polyvalent metal chelate catalyst to its oxidized state, wherein the aqueous solution contains an effective amount of a dispersing agent for maintaining the particulate elemental sulfur in dispersed suspension in the aqueous solution, thereby forming a suspension of the particulate elemental sulfur in said aqueous solution, continuing said contacting until the suspended particulate elemental sulfur reaches at least about 2 percent by weight of the aqueous solution, discarding at least a portion of the aqueous solution containing the suspension of particulate elemental sulfur, and replacing the discarded aqueous solution with fresh aqueous solution and said water soluble oxidized polyvalent metal chelate catalyst for contact with additional hydrogen sulfide containing gaseous stream.

5,004,589

PROCESS FOR PREPARING SODIUM TRIPOLYPHOSPHATE

George W. Cadwallader, Maryland Heights; Louis A. Highfill, Union, both of Mo.; Gregory D. Kurdys, Temperance, and Richard S. Turigliatto, Southgate, both of Mich., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 29, 1989, Ser. No. 442,968
Int. Cl.[5] C01B *15/16, 25/26*
U.S. Cl. 423—315 **19 Claims**

1. A process for preparing granular sodium tripolyphosphate which comprises:

(a) drying a solution of sodium orthophosphate,

(b) sizing said dried orthophosphate to a predetermined particle size, whereby at least about 95%, by weight, has a particle size of from −14 mesh to about +100 mesh, and

(c) calcining the dried, sized orthophosphate whereby sodium tripolyphosphate is formed having the size distribution approximately that of the orthophosphate feed material.

5,004,590

CARBON FIBERS

Warren C. Schimpf, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 5, 1983, Ser. No. 520,785
Int. Cl.[5] D01F *9/12*
U.S. Cl. 425—447.2 **2 Claims**

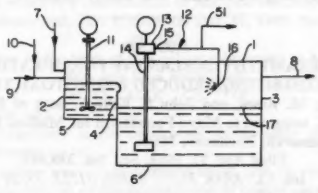
1. Polyacrylonitrile-based carbon fiber in the form of a filament bundle characterized by Modulus and Tensile Strength in the Impregnated Strand Test respectively between about 42 million and 50 million psi and between about 600,000 and 900,000 psi, and Short Beam Shear Strength between about 15,000 and 19,000 psi in the Laminate Test, and wherein said carbon fiber has been electrolytically surface treated at 0.5 columns per inch per approximate 12,000 filaments.

5,004,591

CATALYTIC PROCESS FOR REMOVAL OF HYDROGEN SULFIDES FROM LIQUID SULFUR

Jacques Maurice, Pau; Romain Fouque, Poey de Lescar, and Jean-Louis Auriol, Pau, all of France, assignors to Societe Nationale Elf Aquitaine (Production), Paris La Defense, France

Division of Ser. No. 171,878, file as PCT FR87/00268 on Jul. 8, 1989, published as WO88/00570 on Jan. 28, 1988, Pat. No. 4,897,251.
This application Aug. 25, 1989, Ser. No. 398,789
Claims priority, application France, Jul. 10, 1986, 86 10063
The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.
Int. Cl.[5] B01J *31/02, 31/04;* **C01B** *17/027*
U.S. Cl. 423—578 R **25 Claims**



1. In a process for the removal of H_2S present in liquid sulfur in a dissolved state or combined as hydrogen polysulfides wherein a catalyst system comprising at least one basic compound is admixed with the liquid sulfur and the H_2S is separated from the liquid sulfur, the improvement which comprises including in the catalyst system at least one surfactant compound and wherein said H_2S is separated as a gas.

5,004,592

STEAM REFORMING PROCESS

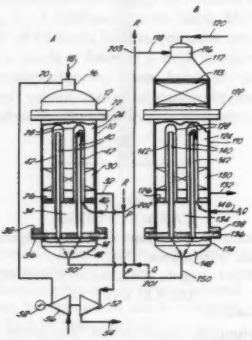
Alwyn Pinto, Cleveland, England, assignor to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 767,067, Aug. 19, 1985, Pat. No. 4,750,986, which is a division of Ser. No. 591,328, Mar. 19, 1984, abandoned. This application May 23, 1988, Ser. No. 197,515

Claims priority, application United Kingdom, Mar. 25, 1983, 8308343

Int. Cl.[5] C01B *3/38*

U.S. Cl. 423—652 3 Claims



1. In a process for producing raw ammonia synthesis gas by the steps of:

(a) primary reforming a hydrocarbon feedstock with seam to give a gas containing carbon oxides, hydrogen, methane and unreacted steam by passing a mixture of the feedstock and steam over a heated catalyst;

(b) reacting the product of step (a) catalytically with an oxygen/nitrogen mixture to decease the content of methane and introduce nitrogen; and

(c) obtaining the endothermic heat required for step (a), part from the hot effluent of step (b) and part from an external heat supply means, by carrying out step (a) in a first stage giving a partially primary reformed gas which is then subjected to further primary reforming in a second stage, with one of the stages being heated from an external heat supply means and the other stage heated by the hot effluent of step (b); the improvement comprising effecting the first stage of step (a) by passing a mixture of the hydrocarbon feedstock and steam over a catalyst, heating the catalyst by indirect heat exchange with both the hot effluent of step (b) and the partially primary reformed gas produced in the first stage, thereby cooling both the hot effluent from stage (b) and the partially reformed gas, and then passing the resusltant cooled partially primary reformed gas to the second stage of step (a), heating the second stage using the external heat supply means.

5,004,593

HEXAMETHYLMELAMINE FORMULATION EXHIBITING REDUCED NEUROTOXICITY

Matthew M. Ames, and John S. Kovach, both of Rochester, Minn., assignors to Mayo Foundation for Medical Education and Research, Rochester, Minn.

Filed Apr. 17, 1989, Ser. No. 339,481

Int. Cl.[5] A61K *31/71, 31/66, 31/53, 33/24*

U.S. Cl. 424—10 7 Claims

1. A method for reducing the peripheral neuropathy associated with chemotherapy with hexamethylmelamine comprising intravenously administering a stabilized solution of an effective antineoplastic amount of hexamethyl-melamine (HMM) to a cancer patient in need thereof; wherein said HMM is dissolved in an aqueous emulsion comprising about 2–20% of an edible oil; about 0.1–7% of a phosphatide and about 1–10% glycerol, so that peripheral neuropathy is reduced from that observed when the same amount of HMM is orally administered.

5,004,594

BENZYLIDENECAMPHOR SULPHONAMIDES DERIVED FROM AMINO ACIDS AND THEIR APPLICATION IN COSMETICS, PARTICULARLY AS SUNSCREENS

Herve Richard; Madeleine Leduc, both of Paris; Serge Forestier, Claye Souilly, and Gerard Lang, Saint Gratien, all of France, assignors to L'Oreal, Paris, France

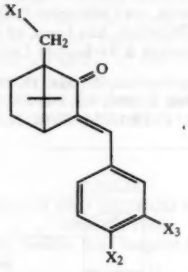
Filed Dec. 21, 1988, Ser. No. 287,054

Claims priority, application Luxembourg, Dec. 22, 1987, 87089

Int. Cl.[5] A61K *7/021, 7/40, 7/42, 9/12*

U.S. Cl. 424—47 15 Claims

1. A cosmetic sunscreening composition for protecting the skin and hair from ultraviolet rays, said composition comprising in a cosmetically acceptable medium and in an amount effective to protect the hair and skin from ultraviolet rays, at least one sulphonamide derived from 3-benzylidenecamphor and having the formula



(I)

wherein

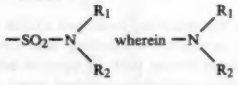
X_1 represents hydrogen or Y,

X_2 represents hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, Y or Z,

X_3 represents hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, Y or Z,

or X_2 and X_3 together form an alkylenedioxy group wherein the alkylene moiety contains 1 or 2 carbon atoms,

Y represents



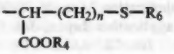
represents an amino acid residue, esterified or not, wherein

R_1 and R_2 represent hydrogen, alkyl or hydroxyalkyl, with the proviso that at least one of R_1 and R_2 represents:

(a)

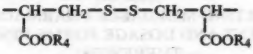
wherein R_3 represents hydrogen, alkyl, hydroxyalkyl, amidoalkyl, aminoalkyl, aralkyl, aryl or alkyl substituted by a heterocyclic ring, or $-(CH_2)_n-COOR_5$ wherein n is 1 to 6 and R_5 represents hydrogen, alkyl or aralkyl or R_3 together with R_1 or R_2 and the nitrogen atom to which they are attached form a heterocyclic ring, and R_4 represents hydrogen, alkyl, aralkyl or aryl,

(b)



wherein n and R_4 have the meanings given above and R_6 represents hydrogen, alkyl, aralkyl or aryl, or

(c)

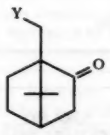


to which two 3-benzylidenecamphor-10-sulphonamide or 3-benzylidenecamphor-3'-sulphonamide or 3-benzylidenecamphor-4'-sulphonamide residues are attached,

R_4 has the meaning given above or an alkali metal or $N^+(R_7)$ wherein R_7 represents hydrogen, C_1–C_4 alkyl or C_2–C_4 hydroxyalkyl,

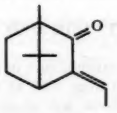
Z represents one of the following

(a) Z_1 which has the formula



wherein Y has the meaning given above, or

(b) Z_2 which has the formula



with the proviso that one of X_1, X_2 and X_3 is different from the other two and that

(α) when X_1 represents hydrogen, X_2 and X_3 are different from each other and cannot be Z_2, one of the two necessarily being Y or Z_1,

(β) when X_1 represents Y, X_2 and X_3 are not simultaneously Y or Z_1 or Z_2, and

(γ) when R_1 or R_2 represents a divalent group of formula (c) in the radical Y, only one of X_1, X_2 and X_3 can be Y, and X_2 and X_3 cannot be Z_1, and in the above,

alkyl represents a straight or branched chain C_1–C_{20} radical,

aryl represents phenyl or a higher homologue thereof unsubstituted or substituted by hydroxy, alkoxy or dialkylamino and which contains 1–20 carbon atoms,

aralkyl represents benzyl or a higher homologue thereof unsubstituted or substituted by hydroxy, alkoxy or dialkylamino and which contains 1–20 carbon atoms, and

alkyl substituted by a heterocyclic ring represents a histidine or tryptophan residue.

5,004,595

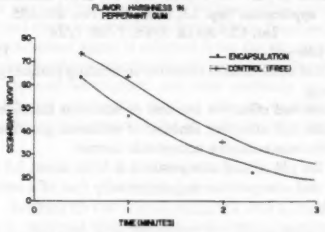
MULTIPLE ENCAPSULATED FLAVOR DELIVERY SYSTEM AND METHOD OF PREPARATION

Subraman R. Cherukuri, Towaco; Tommy L. Chau, Bridgewater; Krishna P. Raman, Randolph, and Angel M. Orama, Stanhope, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 452,660, Dec. 18, 1989, which is a continuation-in-part of Ser. No. 329,742, Mar. 28, 1989, Pat. No. 4,933,190, which is a continuation-in-part of Ser. No. 945,743, Dec. 23, 1986. This application Mar. 30, 1990, Ser. No. 503,331

Int. Cl.[5] A23G *3/30*

U.S. Cl. 424—48 **22 Claims**



1. A free-flowing particulate delivery system for providing enhanced flavor and sweetness to comestible compositions, said delivery system comprising:

(a) a core comprising a flavor in particulate form; and

(b) an encapsulating matrix for said core, said matrix comprising an outer coating of a hydrophilic polymer containing an intense sweetener, said outer coating prepared from a solution of the hydrophilic polymer and said intense sweetener, with said intense sweetener being present in the polymer solution in an amount ranging from about 0.1% to about 50% by weight of said solution, the outer coating present in an amount of from about 2% to about 100% by weight of said core;

(c) wherein the encapsulating matrix protects the flavor in the core and permits higher concentrations of flavor to be included without imparting bitterness to the resulting flavor delivery system, and promotes consistent taste release.

5,004,596

ANHYDROUS TOOTHPASTE OR DENTAL CREAM COMPOSITION

Francis E. Cocherell, 809 Silver Maple Dr., Azusa; Homer C. Harper, 15102 E. Chetney, Baldwin Park, both of Calif. 91702, and George Hsieh, 23943 Sunset Crossing Rd., Covina, Calif. 91765

Continuation-in-part of Ser. No. 139,064, Dec. 21, 1987, Pat. No. 4,812,306, which is a continuation of Ser. No. 819,583, Jan. 17, 1986, abandoned. This application Jan. 17, 1989, Ser. No. 297,172

The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.

Int. Cl.[5] A61K *7/26, 7/18*

U.S. Cl. 424—52 **7 Claims**

1. A chemically stable anhydrous tooth paste or dental cream composition of;

(a) a powdery mixture comprising about 10% to about 90% by total weight of the composition of one or more anhydrous inorganic salts selected from the group consisting of sodium bicarbonate, magnesium sulfate and sodium chloride, about 0.02% to about 25% by total weight of the composition of a flavoring oil, about 0.1% to about 60% by total weight of the composition of glycerin, and about 0.2% to about 25% by total weight of the composition of a powdery absorbent, said flavoring oil and said glycerin

being present in said powdery mixture in solid form absorbed into said absorbent, and

(b) said powdery mixture being uniformly present in about 6% to about 90% by total weight of the composition of a vegetable oil carrier that has been sufficiently hydrogenated to provide cream or paste consistency to the composition.

5,004,597

ORAL COMPOSITIONS COMPRISING STANNOUS FLOURIDE AND STANNOUS GLUCONATE

Satyanarayana Majeti; Christopher B. Guay, and Mark M. Crisanti, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 97,010, Sep. 14, 1987, abandoned. This application Sep. 13, 1989, Ser. No. 406,855

Int. Cl.[5] A61K *7/16, 7/18, 7/24*

U.S. Cl. 424—52 **16 Claims**

1. An oral composition effective in treating plaque/gingivitis comprising:

(a) a safe and effective amount of stannous fluoride;

(b) a safe and effective amount of stannous gluconate; and

(c) a pharmaceutically acceptable carrier

wherein the pH of said composition is from about 3.0 to about 4.79 and said composition is substantially free of a calcium ion source(s).

5,004,598

STABLE AND QUICK-BREAKING TOPICAL SKIN COMPOSITIONS

Robert Y. Lochhead, Avon Lake; Janet Y. Castaneda, Lorain, and Wilfred J. Hemker, Berea, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 928,755, Nov. 10, 1986, abandoned. This application May 31, 1989, Ser. No. 358,924

Int. Cl.[5] A61K *7/15, 7/42, 7/44, 7/50*

U.S. Cl. 424—59 **10 Claims**

1. A storage-stable oil-in-water emulsion composition comprising water, oil, and a lightly crosslinked modified polymer wherein in said emulsion, water forms the continuous phase and oil forms the discontinuous phase in the form of oil droplets dispersed in the water, said modified polymer is a copolymer having a major portion of a monoolefinically unsaturated carboxylic acid monomer or its anhydride of 3 to 6 carbon atoms and a minor portion of a long chain acrylate or methacrylate ester monomer, said emulsion having the characteristic of breaking quickly on contact with an electrolyte, wherein said modified polymer defines a viscosity of 100 to 50,000 cps when measured in the form a 0.2 weight percent aqueous mucilage at pH of about 7.2 to 7.6,

and wherein the components of said composition are given below in weight parts:

Mineral Oil	.1 to 60
Modified Polymer	.05 to 3
Water	45 to 100.

5,004,599

METHOD OF TREATING NAILS

Richard K. Scher, 913 Gardner Dr., P.O. Box P107, Bay Shore, N.Y. 11706

Filed Mar. 31, 1989, Ser. No. 332,354

Int. Cl.[5] A61K *7/04*

U.S. Cl. 424—61 **3 Claims**

1. A method of treating nail units of animals including humans comprising topically applying to the nail unit of an animal a preparation comprising tretinoin to promote growth of the nail unit, the tretinoin being present in said preparation in an amount between 0.025 and 50% by weight.

5,004,600

DEODORIZING AGENT

Atsushi Suzuki, Kamifukuoka, Japan, assignor to Cleanlite Aire Inc., Mississauga, Canada

Continuation-in-part of Ser. No. 884,137, Jul. 10, 1986, abandoned. This application Mar. 26, 1990, Ser. No. 498,664

Claims priority, application Japan, Jul. 12, 1985, 60-153738

Int. Cl.[5] A61L *9/04*

U.S. Cl. 424—76.3 **20 Claims**

1. A composition useful for the treatment of air for the deodorization thereof comprising 100 parts by weight glyoxal, from about 35 to about 65 parts by weight of an organic water soluble polyol and from about 60 to about 100 parts by weight of calcium chloride, in aqueous solution.

5,004,601

LOW-MELTING MOLDABLE PHARMACEUTICAL EXCIPIENT AND DOSAGE FORMS PREPARED THEREWITH

Wallace C. Snipes, Pine Grove Mills, Pa., assignor to Zetachron, Inc., State College, Pa.

Continuation-in-part of Ser. No. 257,569, Oct. 14, 1988. This application Oct. 31, 1988, Ser. No. 264,747

Int. Cl.[5] A61K *9/20, 31/74*

U.S. Cl. 424—78 **7 Claims**

1. A low-melting pharmaceutical excipient consisting essentially of

Low MW Polyethylene glycol (M.P. about 37° C.)	75–90%
Medium to high MW polyethylene glycol	0–4%
Polyethylene oxide (MW 100,000–5,000,000)	0–4%
Colloidal silica	10–20%

5,004,602

CONTINUOUS RELEASE PHARMACEUTICAL COMPOSITIONS FORMED BY FREEZE DRYING ACETIC ACID SOLUTIONS OF POLYLACTIDE

Francis G. Hutchinson, Lymm, United Kingdom, assignor to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 640,855, Aug. 15, 1984, abandoned. This application May 12, 1986, Ser. No. 861,839

Claims priority, application United Kingdom, Feb. 16, 1981, 8104734

Int. Cl.[5] A61K *31/74, 9/50*

U.S. Cl. 424—78 **1 Claim**

1. A process for the manufacture of a pharmaceutical composition comprising (a) from 50% to 99.9% of a polyactide which is a polymer of lactic acid alone, a copolymer of lactic acid and glycolic acid wherein the ratio of glycolide to lactide units is from 0 up to 3:1, a mixture of such polymers, a mixture of such copolymers, or a mixture of such polymers and copolymers, the lactic acid being either in racemic or in optionally active form, and such polylactide being either soluble in benzene and having an inherent viscosity of from 0.093 (1 g. per 100 ml. in chloroforn) to 0.5 (1 g. per 100 ml. in benzene), or insoluble in benzene and having an inherent viscosity of from 0.093 (1 g. per 100 ml. in chloroform) to 4 (1 g. per 100 ml in chloroform or dioxan), and (b) from 0.001% to 50% of a pharmacologically active polypeptide which has a molecular weight at least that of tetragastrin, which is not significantly hydrolyzed under the conditions encountered within the composition during the period of use envisioned, and which contains four or more amino acid residues, said polypeptide being uniformly dispersed in said polylactide, which composition, when placed in an aqueous physiological-type environment absorbs water and exhibits two successive phases of release of polypeptide, the first phase being release by initial diffusion through aqueous polypeptide domains communicating with the exterior surface of the composition, and the second phase

being release consequent upon degradation of the polylactide, characterized in that the diffusion phase and the degradation-induced phase overlap in time, said composition being further characterized by the fact that, when placed in an aqueous physiological type environment, water diffuses into the polylacide and is partitioned between polypeptide and polyactide to form aqueous polypeptide domains, said domains increasing with increasing absorption of water until the continuity of said domains reaches a sufficient level to communicate with the exterior surface of the composition, whereupon polypeptide starts to be released from said composition by diffusion through aqueous polypeptide channels formed from said domains, which second phase continues until substantially all of the remaining polypeptide is released, said process comprising:

dissolving said polylactide and said polypeptide in glacial acetic acid,

freeze drying the resulting solution, and

shaping the resulting freeze dried powder at an elevated temperature.

5,004,603

FEEDING LIVESTOCK

Barry A. Thompson, 4 Gilstrap Close, Beacon Heights, Newark Notts., United Kingdom, assignor to Rene Pich; Hubert Issaurat, both of, France and Barry A. Thompson, United Kingdom

Filed Mar. 11, 1987, Ser. No. 24,575

Claims priority, application United Kingdom, Mar. 11, 1986, 8605969; Apr. 25, 1986, 8610199; Jul. 8, 1986, 8616564

Int. Cl.[5] A61K *31/78, 9/50;* **A23K** *1/18*

U.S. Cl. 424—81 **21 Claims**

1. A method of feeding a ruminant comprising administering to said ruminant a feed-conversion rate increasing non-toxic amount of a swollen water swellable water insoluble polymer material in an amount equivalent to at least 0.04 kg swollen polymer per day per 100 kg ruminant body weight.

5,004,604

IMMUNO-SUPPRESSIVE MATERIAL AND PROCESS FOR PREPARING SAME

Peter Terness, and Gerhard Opelz, both of Heidelberg, Fed. Rep. of Germany, assignors to Fresenius A. G., Bad Homburg, Fed. Rep. of Germany

Filed Mar. 25, 1988, Ser. No. 178,643

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1986, 3626110.6

Int. Cl.[5] A61K *37/66, 35/14*

U.S. Cl. 424—85.5 **6 Claims**

1. A process for the production of an immuno-suppressive serum containing IS-IGG comprising the steps of:

(a) incubating animal cells with homologous or heterologous antibodies, which specifically bind to said cells, whereby said cells are coated with said antibodies,

(b) washing said incubated cells,

(c) multiply injecting said cells into a recipient animal,

(d) after a predetermined incubating time, taking the blood from the recipient animal and separating the serum therefrom.

5,004,605

LOW PH PHARMACEUTICAL COMPOSITIONS OF RECOMBINANT BETA-INTERFERON

Susan Hershenson, San Francisco, and Jody Thomson, Albany, both of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed Dec. 10, 1987, Ser. No. 131,375

Int. Cl.[5] C07K *15/26*

U.S. Cl. 424—85.6 **16 Claims**

1. A stable pharmaceutical composition of matter suitable for parenteral administration to mammals that is at a pH range of from about 2 to about 4 comprising a therapeutically effective amount of a recombinant interferon-β protein dissolved in an inert carrier medium comprising as a stabilizer/solubilizer an effective amount of polyethylene glycol polymers having an average molecular weight from about 190 to about 1600 daltons in the substantial absence of detergents and at a pH between 2 and 4.

5,004,606

NON-COVALENT ANTIBODY-ANTHRACYCLINE IMMUNOCOMPLEXES

James M. Frincke, Olivenhain; Richard M. Bartholomew, San Diego, and Robert O. Dillman, Solana Beach, all of Calif., assignors to Hybritech Incorporated, San Diego, Calif.

Filed Sep. 24, 1986, Ser. No. 911,269

Int. Cl.[5] A61K *37/00, 39/00*

U.S. Cl. 424—85.8 **14 Claims**

1. A composition for treating in vivo a disorder associated with chronic lymphocytic leukemia, cutaneous T-cell lymphoma, or other human T-cell neoplasm, comprising a non-covalent immunocomplex of an anthracycline agent and a monoclonal antibody or antigen-recognizing fragment thereof, said anthracycline agent is selected from the group consisting of doxorubicin, doxorubicin-14-valerate, morpholinodoxorubicin and derivatives thereof, and said antibody or antibody fragment being selected to bind an antigen recognized by a T101 antibody and enhance the in vivo cytotoxicity of said agent.

5,004,607

METHOD OF IMMUNIZING POULTRY

William L. Ragland, and Mohamed G. Elfaki, both of Athens, Ga., assignors to University of Georgia Research Foundation, Inc., Athens, Ga.

Continuation of Ser. No. 89,350, Aug. 25, 1987, abandoned. This application Jan. 11, 1989, Ser. No. 296,319

Int. Cl.[5] A61K *39/00;* **C12N** *1/00*

U.S. Cl. 424—88 **14 Claims**

1. An improved method of immunizing poultry against a disease comprising the steps of:

(a) first inoculating the poultry with a poultry vaccine preparation, wherein the first inoculation is intracoelomic; and

(b) subsequently inoculating the poultry with a poultry vaccine preparation.

5,004,608

AMEBIASIS VACCINE

Jonathan I. Ravdin, Earlysville, and William A. Petri, Jr., Palmyra, both of Va., assignors to The University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Continuation of Ser. No. 143,626, Jan. 13, 1988, abandoned. This application Dec. 29, 1989, Ser. No. 456,579

Int. Cl.[5] A61K *39/02, 39/00*

U.S. Cl. 424—88 **5 Claims**

1. The process of immunizing against *Entamoeba histolytica* comprising

using 170K Dalton purified galactose specific lectin protein of *E. hostolytica* in vaccinating the host with the vaccine, eliciting a host immune response against the vaccine, and immunizing the host against invasive amebiasis by *E. histolytica* trophozoites.

Continuation of Ser. No. 199,250, May 26, 1988, abandoned, which is a continuation of Ser. No. 919,149, filed as PCT JP85/00673 on Dec. 6, 1985, published as WO86/03973 on Jul. 17, 1986, Pat. No. 4,851,345.

5,004,609

FIBRINOPHILIC UROKINASE COMPLEX

Shigeru Hayashi, and Kaneo Yamada, both of Tokyo, Japan, assignors to Shiseido Company Ltd., Tokyo, Japan

Filed Sep. 5, 1989, Ser. No. 403,895

Claims priority, application Japan, Jan. 14, 1985, 60-4530

Int. Cl.[5] A61K *37/547;* **C12N** *9/00*

U.S. Cl. 424—94.3 **8 Claims**

1. A purified urokinase complex substantially free of urine, said complex comprising urokinase and a urokinase inhibitor, said complex having a molecular weight of 97,500±3,000, and

said complex having plasminogen activator activity and fibrin affinity.

5,004,610

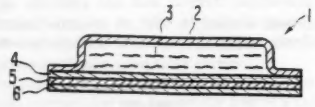
SUBSATURATED NICOTINE TRANSDERMAL THERAPEUTIC SYMSTEM

James L. Osborne, Mountain View; Melinda Nelson, Sunnyvale; David J. Enscore, Satatoga; Su I. Yum, and Robert M. Gale, both of Los Altos, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 206,546, Jun. 14, 1988, abandoned, and a continuation-in-part of Ser. No. 2,561, Jun. 13, 1989, abandoned. This application Jun. 14, 1990, Ser. No. 537,672

Int. Cl.[5] A61F *13/02*

U.S. Cl. 424—448 29 Claims



1. A medical device for the transdermal administration of nicotine, said device being adapted to deliver nicotine during a predetermined nicotine administration period of at least about eight hours at a rate within the range of about 250–4000 μg/hr for a substantial portion of said administration period, said device comprising, in combination:

a. nicotine reservoir comprising said nicotine dissolved in a solvent at a concentration less than saturation and at an initial equilibrated nicotine loading sufficient to prevent the concentration of nicotine in said solvent from decreasing by more than 75% during said administration period;

b. nicotine release rate controlling means disposed in the path of nicotine migration from said reservoir to the skin, said rate controlling means being permeable to nicotine and substantially impermeable to said solvent;

c. adhesive means disposed in the path of nicotine migration from said release rate controlling means to the skin; and

d. removable release liner means on said adhesive.

5,004,611

PRO-LIPOSOME COMPOSITIONS

Steven Leigh, Croydon, England, assignor to Phares Pharmaceutical Research NV, Curacao, Netherlands Antilles

Continuation of Ser. No. 709,796, Mar. 8, 1985, abandoned. This application Mar. 21, 1988, Ser. No. 171,148

Claims priority, application United Kingdom, Mar. 8, 1984, 8406038; Mar. 16, 1984, 8406919

Int. Cl.[5] A61K *37/22*

U.S. Cl. 424—450 25 Claims

1. A pro-liposome composition comprising a uniform mixture of:

(a) at least one membrane lipid and

(b) at least one non-aqueous liquid consisting essentially of a water-miscible organic liquid which is a solvent for the lipid and

(c) a biologically active compound and which, upon a step consisting essentially of the addition of a sufficient amount of water, spontaneously forms liposomes,

the proportion by weight of (a) to (b) being from 40:1 to 1:20 and

component (c) being present in an amount sufficient that a predetermined biologically effective dosage of the biologically active compound is associated with the liposomes.

5,004,612

PHARMACEUTICAL COMPOSITIONS COMPRISING ESTERS OR AMIDES AS ACTIVE INGREDIENTS

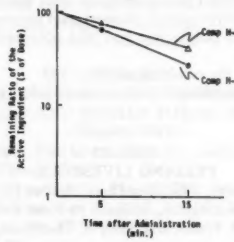
Soonih Kim; Kazuhisa Takeda, and Seiei Sasatani, all of Osaka, Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 180,933, Apr. 13, 1988, Pat. No. 4,889,723. This application Oct. 5, 1989, Ser. No. 417,537

Claims priority, application Japan, Apr. 13, 1987, 62-88785

Int. Cl.[5] A61K *37/22*

U.S. Cl. 424—450 7 Claims



1. A pharmaceutical composition consisting essentially of a prolinal or thiazolidine derivative having at least one amido bond suspended or dissolved in a middle chain glyceride of a fatty acid of 4 to 10 carbon atoms or mixtures thereof.

5,004,613

ORAL SUSTAINED RELEASE PHARMACEUTICAL FORMULATION AND PROCESS

Galen W. Radebaugh, Chester, N.J.; John L. Murtha, Holland, and Robert Glinecke, Glenside, both of Pa., assignors to McNeil-PPC, Inc., Milltown, N.J.

Continuation-in-part of Ser. No. 299,178, Jan. 19, 1989, which is a continuation-in-part of Ser. No. 78,138, Jul. 27, 1987, Pat. No. 4,820,522. This application Aug. 11, 1989, Ser. No. 392,748

The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.

Int. Cl.[5] A61K *9/22*

U.S. Cl. 424—465 20 Claims

1. A process of preparing a pharmaceutical-sustained release shaped and compressed tablet characterized by a slow release of pharmaceutical active upon administration comprising the following steps:

(A) forming a granulating agent by dissolving 5–25 parts by weight of the total composition of povidone in water or in an alcohol-water mixture;

(B) blending together, in parts by weight of the total composition, the following ingredients, with sufficient pharmaceutical active to comprise about 68 to 94 percent by weight of the total composition, in dry powder form, 5–25 parts by weight hydroxyethyl cellulose and 5–25 parts by weight of a wicking agent;

(C) adding and mixing the granulating agent from Step A to the blended powders from Step B, to form a wet granulation;

(D) drying the wet granulation of Step C;

(E) milling the dried granulation from Step D;

(F) thoroughly blending the milled dried granulation from Step E with the following parts by weight of the total composition of ingredients in dry powder form: 1–15 parts by weight erosion promoter, 5–45 parts by weight wicking agent, 0–10 parts by weight lubricant and 0–5 parts by weight glidant; and

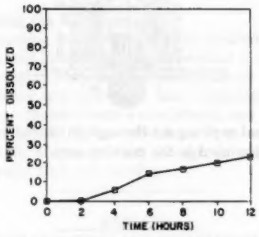
(G) compressing the final granulation from Step F into a tablet or tablet layer.

5,004,614

CONTROLLED RELEASE DEVICE WITH AN IMPERMEABLE COATING HAVING AN ORIFICE FOR RELEASE OF DRUG

John N. Staniforth, Bath, England, assignor to Forum Chemicals Ltd., Redhill, England

Filed Aug. 25, 1989, Ser. No. 398,632
Int. Cl.[5] A61K *9/22*
U.S. Cl. 424—466 27 Claims



1. A device for controlled release of an active agent, comprising

a core comprising an active agent and a release modifying agent; and

an outer coating covering said core, the thickness of said coating being adapted such that it is substantially impermeable to the entrance of an environmental fluid present in an environment of use and substantially impermeable to the exit of said active agent during a dispensing period, said coating including an orifice extending substantially completely through said coating but not penetrating said core and communicating from said environment of use to said core for allowing the release of said active agent into said environment of use, said orifice having an area from about 10 to about 60 percent of the face area of said device, the rate limiting step for the release of said active agent substantially being the exit of said active agent through said orifice via one or more of dissolution, diffusion or erosion of said active agent in solution or suspension, said release modifying agent enhancing or hindering the release of said active agent depending upon the solubility and/or effective solubility of said active agent in said environment of use.

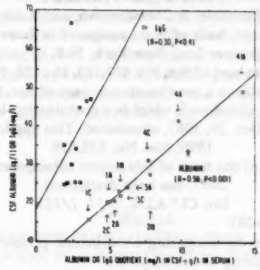
5,004,615

METHODS FOR DIAGNOSING, MONITORING AND CONTROLLING THE ONSET AND PROGRESSION OF CERTAIN DEMENTIAS AND IMPEDING MEMORY LOSS OR IMPROVING IMPAIRMENT OF MEMORY

J. Leslie Glick, Potomac, Md., assignor to Bionix Corporation, Potomac, Md.

Continuation of Ser. No. 322,382, Mar. 13, 1989, Pat. No. 4,985,256, which is a division of Ser. No. 203,174, Apr. 27, 1988, Pat. No. 4,837,164. This application Jul. 25, 1990, Ser. No. 557,235
The portion of the term of this patent subsequent to Jan. 15, 2008, has been disclaimed.
Int. Cl.[5] A61K *33/06, 33/10;* C01F *5/02, 5/40*
U.S. Cl. 424—692 30 Claims

1. A method for impeding loss of memory or improving impairment of memory comprising orally administering Mg alone or in combination with another anti-memory loss agent to a subject whose dietary intake of Mg is below the normal intake of about 200 to 450 mg/day, such that the supplemental



daily intake of Mg in the subject is in an amount of from about 200 to 1,620 mg/day.

5,004,616

PROCESS FOR PREPARING MICROWAVE-REHEATABLE FRENCH FRIED POTATOES AND PRODUCT THEREOF

Sudhakar P. Shanbhag, Carlisle; Joseph J. Cousminer, Stoneham, and Gerald Milani, Uxbridge, all of Mass., assignors to Horizons International Foods, Inc., Burlington, Mass.

Continuation-in-part of Ser. No. 248,854, Sep. 28, 1988, Pat. No. 4,931,296, which is a continuation-in-part of Ser. No. 193,370, May 12, 1988, abandoned. This application Feb. 22, 1990, Ser. No. 483,598
The portion of the term of this patent subsequent to Jun. 5, 2007, has been disclaimed.
Int. Cl.[5] A23L *1/217*
U.S. Cl. 426—102 21 Claims

1. A process for preparing french fried potatoes suitable for subsequent reheating in a microwave oven to obtain a product having a crisp exterior and a tender interior, comprising

finish frying potato strips, and thereafter

coating said potato strips with toasted potato granules to provide a thin coherent coating of said potato granules on said potato strips, and

coating said finish fried potato strips with from about 0.8 to about 1.2 percent by weight fat-encapsulated salt.

5,004,617

METHOD OF HEATING FOOD

Robert F. Bowen, Burlington; Kenneth W. Dudley, Sudbury, and Joseph C. Maiellano, Jr., Chelmsford, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 197,716, May 23, 1988, Pat. No. 4,917,006. This application Jan. 11, 1990, Ser. No. 448,408
Int. Cl.[5] A23L *1/00*
U.S. Cl. 426—233 4 Claims

1. A method of regulating the temperature of a grill for supporting food to be cooked, comprising the steps of:

providing a grill that expands when heated;

placing food on said grill;

applying heat to said grill to cook said food; and

reducing said heat applied to said grill in response to expansion of said grill.

5,004,618

PROCESS FOR PREPARING MARINADED PROTEINACEOUS PRODUCT AND PRODUCT PRODUCED THEREBY

Lawrence L. Buckholz, Jr., Middletown, and Robin Kasper-Lehmann, Elberon, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 457,162, Dec. 26, 1989, Pat. No. 4,942,047, which is a continuation-in-part of Ser. No. 371,074, Jun. 26, 1989, abandoned, which is a continuation-in-part of Ser. No. 114,057, Oct. 29, 1987, abandoned. This application Jun. 8, 1990, Ser. No. 535,539

The portion of the term of this patent subsequent to Jul. 17, 2007, has been disclaimed.

Int. Cl.[5] **A23L** *1/31, 1/315*

U.S. Cl. 426—281 **12 Claims**

1. A process for preparing a marinaded proteinaceous food product consisting of the steps of:

(a) providing a meat muscle tissue inner food core having an outer surface;

(b) preparing a marinade mixture consisting of:

(i) from about 3 up to about 6% by weight of said marinade mixture of an inorganic non-toxic phosphate salt;

(ii) water;

(iii) from about 10% up to about 70% by weight of said marinade mixture of a reaction flavor produced by admixing:

1. 30–80% of a macerated meat;
2. 0.05–1.5% of cysteine hydrochloride;
3. 0.1–1.5% of thiamine hydrochloride;
4. optionally, 2–30% of a polysaccharide and/or a reducing sugar metabolite; and, optionally,
5. an inorganic salt other than a phosphate to form an admixture and then heating said admixture;

(iv) optionally, from about 5 up to about 15% by weight of said marinade mixture of a non-toxic edible salt other than a phosphate salt; and

(v) optionally, from about 5 up to about 30% by weight of said marinade mixture of tomato paste and/or a spice;

(c) coating the resulting mixture prepared in (b) onto said outer surface and simultaneously causing the mixture of (b) to be in intimate contact with substantially the entirety of said outer surface for a period of time sufficient to cause said meat muscle tissue inner food core to permanently absorb or adsorb said reaction flavor from the mixture (b); and then

(d) cooking the resulting coated meat muscle tissue inner core.

5,004,619

PRODUCTION METHOD OF FORMING SOLID STATE FOOD MATERIAL COMPLETELY WRAPPED AND SEALED IN A CLAYISH STATE FOOD MATERIAL

Masao Kobayashi, 413-2, Nittazuka, Fukui-shi, Fukui-ken, Japan

Division of Ser. No. 156,802, Feb. 17, 1988, Pat. No. 4,854,842. This application May 23, 1989, Ser. No. 355,681

Claims priority, application Japan, Feb. 25, 1987, 62-43629

Int. Cl.[5] **A23P** *1/08, 1/10*

U.S. Cl. 426—297 **3 Claims**

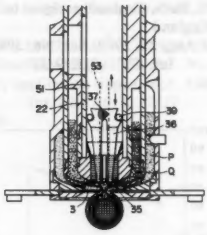
1. A method for forming wrapping and sealing a solid state food material with a state food material, thereby forming a globular product, comprising the steps of:

injecting clayish state food material into a cylindrical mold cavity, thereby forming a cylinder of clayish state food material, the cylinder having an annular side wall and a bottom resting on a gate covering a bottom of the mold cavity;

placing the solid state food material into the cylinder of clayish state food material;

pushing the solid state food material towards the bottom of the cylinder while opening the gate;

closing the gate to thereby envelope the solid state food material in the clayish state food material; and



inspiring and expiring air through an air path provided in a push piston used in the pushing step.

5,004,620

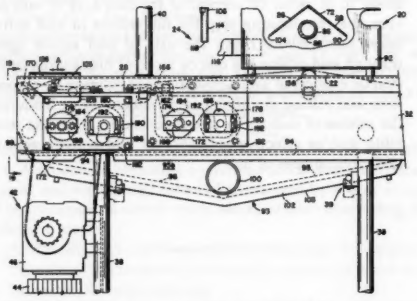
METHOD AND APPARATUS FOR ENROBING CONFECTIONS

Jay G. Straight, Richmond, and Henry P. Moore, Glen Allen, both of Va., assignors to Eskimo Pie Corporation, Richmond, Va.

Filed Apr. 27, 1990, Ser. No. 515,559

Int. Cl.[5] **A23G** *3/00;* **B05C** *5/00*

U.S. Cl. 426—304 **32 Claims**



32. A method for enrobing confections with an enrobing material, said method comprising:

a. providing a pair of first and second transversely extending, longitudinally spaced curtains of liquid enrobing material for contacting confections at longitudinally spaced positions in a conveying direction to coat top and side surfaces of the confections with enrobing material;

b. directing a first curtain of air against the top surfaces of the confections between the first and second enrobing material curtains to provide a smooth first layer of enrobing material on the confections and to remove excess enrobing material;

c. directing a second curtain of air against upper surfaces of the confections downstream of the second enrobing material curtain to provide a smooth second layer of enrobing material on the confections; and

d. contacting bottom surfaces of the confections with enrobing material to substantially completely enrobe the confection with enrobing material.

5,004,621

METHOD OF PROCESSING A FOOD PRODUCT HAVING A LIQUID CONTENT

Franco Sommi, and Pier L. Arelli, both of Parma, Italy, assignors to Manzini, S.p.A, Parma, Italy

Filed Mar. 29, 1989, Ser. No. 329,976
Claims priority, application Italy, Feb. 3, 1989, 19311 A/89
Int. Cl.[5] A23F *3/00*
U.S. Cl. 426—386 13 Claims

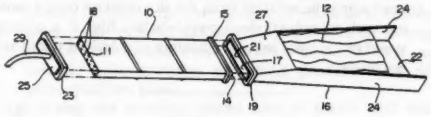
1. A method for processing a food product having a liquid, comprising:
(a) deaerating the food product;
(b) disintegrating said deaerated food product;
(c) heating said disintegrated food product to a temperature for forming an evaporate containing flavor substances;
(d) condensing and collecting said evaporate of the food product to thereby form a condensate; and
(e) recovering said flavor substances from said evaporate; wherein the above steps (a) through (e) are substantially immediately after one another.

5,004,622

PROCESS FOR COOKING AND SHAPING MEAT PIECES

Paul Choquette, Longueuil, Canada, assignor to Corporation Salaison Melrose, Montreal, Canada

Division of Ser. No. 261,039, Oct. 21, 1988, abandoned. This application May 15, 1990, Ser. No. 523,573
Claims priority, application Canada, Sep. 29, 1988, 578876
Int. Cl.[5] A22C *7/00*
U.S. Cl. 426—513 3 Claims



1. A process for cooking and shaping a precut uncooked piece meat in a cooking and shaping mold including an inlet and perforated wall means generally opposite to said inlet, said process comprising the steps of:
placing the uncooked piece of meat adjacent said inlet of the cooking and shaping mold;
producing a vacuum in said cooking and shaping mold through said perforated wall means in order to drive the piece of meat in said cooking and shaping mold through the said inlet; and
applying heat to said piece of meat after it has been driven into said mold in order to cook said piece of meat.

5,004,623

AQUEOUS FOAMING COMPOSITION AND METHOD FOR HOMOGENEINZINGLY INCORPORATING WATER INTO LIPOPHILIC MATERIALS

Claude Giddey, Geneva, and Georges Dove, Carouge/GE, both of Switzerland, assignors to Battelle Memorial Institute, Carouge/GE, Switzerland

Continuation-in-part of Ser. No. 204,478, Jun. 20, 1988, abandoned. This application Oct. 3, 1989, Ser. No. 416,300
Claims priority, application Switzerland, Jun. 26, 1987, 2409/87
Int. Cl.[5] A23L *1/00*
U.S. Cl. 426—564 20 Claims

1. A method for intimately and homogeneously incorporating water into lipophilic materials containing physiologically acceptable fats, comprising the steps of thoroughly blending said material brought to a fluidized state with a foam consisting of fine bubbles of air or of a physiologically acceptable gas dispersed in said water, then removing the air or gas from the blend
wherein the foam is obtained by whipping an aqueous solution of a physiologically acceptable foaming agent in the presence of air or a gas, or by pressure-dissolving said air or gas in the solution and releasing suddenly the pressure, said foamers having sufficient foaming capacity to provide aqueous foams of density 0.2 g/cm^3
and wherein said foaming agent is an amphipatic compound comprising at least a hydrophilic group and a hydrophobic lipophilic group said lipophilic group containing the lipophilic material, thus enabling the water in the foam to become intimately mixed with the lipophilic material.

5,004,624

SEMI-MOIST PET FOOD HAVING FREE GRAVY AND PROCESS FOR PREPARATION THEREOF

Francis L. Koschak, Irvine, and Felicisimo S. Sarno, Cerritos, both of Calif., assignors to Star-kist Foods, Inc., Long Beach, Calif.

Continuation of Ser. No. 474,986, Mar. 14, 1983, abandoned. This application Jul. 17, 1989, Ser. No. 380,769
Int. Cl.[5] A23K *1/00*
U.S. Cl. 426—623 1 Claim

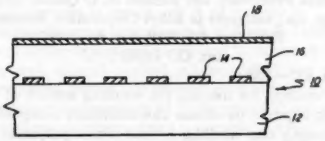
1. A process for preparing a shelf-stable semi-moist nutritionally balanced pet food having free gravy consisting of the steps of:
intermixing milled farinaceous and proteinaceous ingredients with 0.25 to 2.0 percent by weight of vital wheat gluten binder, said binder capable of imparting structural integrity to kibs formed with said intermixture when immersed in an aqueous solution;
forming kibs with said intermixture having a water activity of less than 0.9;
preparing a liquid gravy having a water activity of less than 1.0 but greater than the water activity of the kibs;
combining the kibs and gravy in a ratio of more than about 1.2 parts by weight gravy to 1 part by weight kibs; and
packaging said combination and allowing said water activities in said components to equilibrate prior to consumption wherein said equilibrated semi-moist pet food has a water activity of less than 0.9 and a pH of less than about 4.7.

5,004,625

SOLID STATE LIGHT MODULATOR INCORPORATING METALLIZED GEL AND METHOD OF METALLIZATION

Efim S. Goldburt, and Richard E. Hemmer, both of Briarcliff Manor, N.Y., assignors to North American Philips Corporation, New York, N.Y.

Division of Ser. No. 84,260, Aug. 11, 1987. This application May 3, 1988, Ser. No. 347,311
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—38 11 Claims



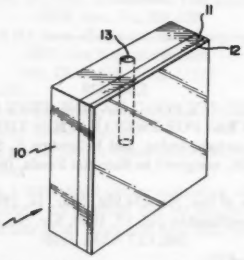
1. A method for metallizing the surface of a silicon and oxygen containing gel, the method comprising:
(a) pretreating the surface with an oxygen-containing plasma, followed by
(b) forming a metal layer on the treated surface.

5,004,626

ANODES AND METHOD OF MAKING

Dennis F. Dong, Kingston, Canada, and Richard E. Loftfield, Jacksonville, Fla., assignors to Huron Technologies, Inc., Kingston, Canada

Continuation-in-part of Ser. No. 923,363, Oct. 27, 1986, abandoned. This application May 31, 1989, Ser. No. 359,263
Int. Cl.[5] B05D 5/12
U.S. Cl. 427—58 12 Claims



1. A method for making an electrode suitable for use in an electrochemical process, comprising:

providing a base formed at least partially of at least one valve metal or alloy thereof,

applying to said base a first composition which is a barrier precursor forming composition comprising a compound of ruthenium, a compound of a film-forming metal and a solvent, to form a coated layer on said base,

thereafter subjecting said coated base to heating at a temperature from room temperature up to about 280° C. for a sufficient period of time to dry said coated base without significant decomposition or oxidation of said compound of ruthenium and said compound of film-forming metal,

then, without baking the coated base to decompose and oxidize therein said compound of ruthenium and said compound of film-forming metal, applying to said coated base at least one coating from a second composition, different from the first, which second composition contains a solvent and an organic reducing agent and is a noble metal compound containing composition capable of forming an electrocatalytic coating, and thereafter

baking the said base to which said second composition is applied at a temperature of 300°–600° C.

5,004,627

POLYIMIDES FOR MOLD RELEASE

J. Kenneth Presswood, and Alethea H. O'Quinn, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Oct. 10, 1989, Ser. No. 419,395
Int. Cl.[5] B05D 3/02
U.S. Cl. 427—133 22 Claims

1. A method for treating the working surface of a mold in order to improve its release characteristics comprising

(a) coating said working surface with a polyamic acid solution consisting essentially of the reaction product of 2,2-bis[4-(aminophenoxy)phenyl]hexafluoropropane and an aromatic tetracarboxylic acid or dianhydride or ester derivative thereof; and

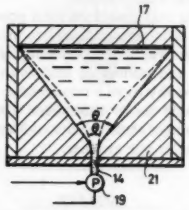
(b) applying sufficient heat to cure the coating such that the polyamic acid is converted to a polyimide.

5,004,628

COATING METHOD AND APPARATUS

Fumitaka Terai; Kimio Yukawa; Mineo Suyefuji; Hiroki Saito, and Shigeru Yamaguchi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 196,404, May 20, 1988, abandoned. This application Jan. 26, 1990, Ser. No. 470,399
Claims priority, application Japan, May 22, 1987, 62-124034
Int. Cl.[5] B05D 1/26
U.S. Cl. 427—389.9 2 Claims



1. A coating method comprising the steps of:

(a) supplying a polyacrylic amide coating solution 13% in density and 12 cps in viscosity at room temperature to an inlet of a coating head;

(b) causing the solution to flow through the head from the inlet along a flow path increasing in width at an angle of divergence equal to 40° while decreasing in thickness at an angle of convergence equal to 0.35° to a slot opening in the head; and

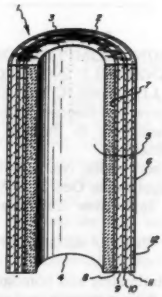
(c) extruding the solution from the slot opening onto a moving web of polyethylene terephthalate film at a coating speed of 1 m/mm to form a coating of a desired width and thickness.

5,004,629

TRANSFER TUBE

Paul S. Svec, Scotia; Marcus P. Borom, Schenectady; Lawrence E. Szala, Scotia; Milivoj K. Brun, Ballston Lake; Steven A. Miller, Amsterdam, all of N.Y., and David P. Mourer, Danvers, Mass., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 367,411, Jun. 16, 1989, Pat. No. 4,966,201. This application May 23, 1990, Ser. No. 527,471
Int. Cl.[5] B05D 1/18, 5/02
U.S. Cl. 427—204 15 Claims



1. A process for producing a transfer tube useful for transfer of molten metal comprised of a high density hollow tube, having directly bonded to its outer surface wall a continuous multi-layered ceramic oxide sentered shell with a maximum density of about 80% of theoretical and wherein at least about 75 weight % of said shell is comprised of polycrystalline phase,

said shell having a thermal conductivity significantly lower than that of said high density tube, which comprises:

(a) providing a high density polycrystalline hollow tube comprised of ceramic oxide, said high density tube having two open ends and a density of at least about 90% of its theoretical density;

(b) forming an alkaline aqueous slurry having a solids content ranging from about 45% to about 60% by volume of the total volume of said slurry, said solids content being comprised of particles of slurry-forming size of ceramic oxide, solid polymer which thermally decomposes at an elevated temperature below 800° C. and colloidal silica, said ceramic oxide ranging about 93% to about 96% by weight of said solids content, said polymer ranging from zero to about 2% by weight of said solids content, and said colloidal silica ranging from about 3% to about 6% by weight of said solids content, said slurry having a pH ranging from about 9 to 12, said slurry having a specific gravity at about 20° C. ranging from about 2.2 g/cc to about 2.7 g/cc and a viscosity at about 20° C. ranging from about 9 to about 15 seconds as measured with a No. 4 Zahn cup;

(c) plugging both open ends of said high density tube with solid polymeric material which thermally decomposes at an elevated temperature below about 800° C.;

(d) immersing said plugged tube into said slurry;

(e) recovering said tube from said slurry forming a wet coating of slurry on the exposed outer surface wall of said tube leaving no significant portion thereof exposed;

(f) contacting the resulting wet coated tube with coarse ceramic oxide particles to form a coating thereof on said wet coating of slurry leaving no significant portion thereof exposed, said coarse ceramic oxide particles being of a size which forms said coating thereof on said wet coating of slurry, the average size of said coarse ceramic oxide particles being significantly larger than the average size of the ceramic oxide particles in said slurry, said ceramic oxide particles permitting production of said polycrystalline phase;

(g) drying the resulting coated tube to permit said silica particles to combine with water to produce a dimensionally stable silica gel which binds the ceramic oxide particles;

(h) immersing the resulting dry coated tube into said slurry to coat said tube;

(i) recovering the coated tube from said slurry forming a wet coating of slurry on the coating of coarse ceramic oxide particles leaving no significant portion of said coating of coarse ceramic oxide particles exposed;

(j) drying the resulting coated tube to permit said silica particles to combine with water to produce a dimensionally stable silica gel, said silica gel thermally decomposing at an elevated temperature to silica;

(k) firing the resulting coated tube to a temperature sufficient to decompose any organic polymer, remove any elemental carbon and produce the sintered shell directly bonded to the outer surface wall of said transfer tube, said firing being carried out in an atmosphere or a partial vacuum which has no significant deleteriuos effect thereon; and

(l) before or after step (k) providing said high density tube with ends free of shell material.

5,004,630

PROCESS OF MAKING ZONE ADHESIVE/RELEASE COATED TAPE

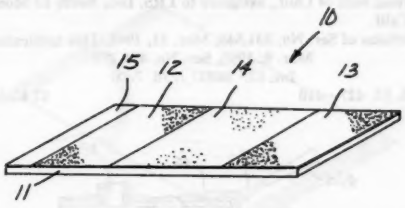
Stephen P. Polski, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 8, 1990, Ser. No. 520,535

Int. Cl.[5] B05D *5/10*

U.S. Cl. 427—208.8 **7 Claims**

1. A process for forming an adhesive closure tab with release surfaces adjacent adhesive surfaces comprising the steps of, coating a continuous region of a tape backing with a soluble low adhesion backsize composition, drying said low adhesion backsize composition, solvent zone coating an adhesive on at least one strip of said tape backing previously coated with said



low adhesion backsize thereby slightly dissolving said backsize so as to promote adherence of said adhesive to said backsize.

5,004,631

SURFACE TREATMENT WITH SULFONATE ESTER POLYMER

Martyn Humphries, Manchester; Jozef Nemcek, Chester; John C. Padget, Frodsham, and Christopher C. Mollett, Littleton, Nr Chester, all of England, assignors to Imperial Chemical Industries PLC, London, England

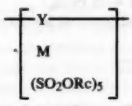
Division of Ser. No. 376,145, Jul. 5, 1989, Pat. No. 4,970,269, which is a continuation of Ser. No. 5,801, Jan. 22, 1987, abandoned. This application Aug. 27, 1990, Ser. No. 572,604

Claims priority, application United Kingdom, Jan. 22, 1986, 8601451; Apr. 21, 1986, 8609702

Int. Cl.[5] B05D *1/00*

U.S. Cl. 427—385.5 **1 Claim**

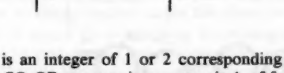
1. Method of treating a surface which method comprises applying to the surface a water-erodible coating composition thereby to form on the surface a water-erodible coating, which composition is a paint composition comprising at least one erodible polymer, wherein said at least one erodible polymer is a polymer which comprises one or more repeat units A each comprising at least one hydrolysable sulphonate ester group pendant to the main chain backbone of the polymer, wherein said repeat unit A has the formula:



I

wherein

Y, which is the repeat units A of formula I may be the same or different, is a group in the main chain backbone and is selected from



s is an integer of 1 or 2 corresponding to the number of SO_2ORc groups in repeat unit A of formula I;

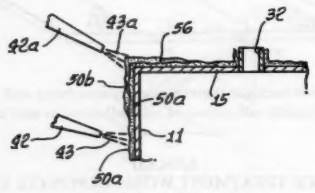
Rc, which in the same repeat units A of formula I may be the same or different, is a group selected from one or more of alkyl, aryl, alkaryl, aralkyl, alkenoxyalkyl and poly(alkenoxy) alkyl groups and wherein each SO_2ORc group is joined via an intermediary M to the group Y; and wherein M represents an intermediary n a repeat unit A of formula I which is selected from —alkylene—, —CO—O—(alkylene)—, —CO—NH—(alkylene)—, —NH—CO— (alkylene)—, —(arylene)—, —(alkylene)—(arylene)—, (alkylene)—O—(alkylene)—(alkylene)—O—(arylene)—, —(arylene)—O—(arylene)—, —(arylene)—O—(alkylene)—, —alkenoxy—, and —polyalkylenoxy—groups.

5,004,632

FIRE RESISTANT TANK CONSTRUCTION

David C. McGarvey, San Gabriel, and Jerry E. Buffalini, Corona, both of Calif., assignors to LRS, Inc., South El Monte, Calif.

Division of Ser. No. 331,548, Mar. 31, 1988. This application Mar. 9, 1990, Ser. No. 491,272
Int. Cl.[5] B05D *1/36, 7/00*
U.S. Cl. 427—410 12 Claims



1. In the method of providing fire resistant tank apparatus adapted for transportation and installation above ground to receive and dispense a liquid hydrocarbon or hydrocarbons, or the like, the steps that include:

(a) providing a metallic tank having lightweight upright side wall means, a top wall and a bottom wall,

(b) providing first means on the top wall defining access porting to the tank interior,

(c) providing second means projecting beneath said bottom wall to support the tank at an above ground installation site,

(d) applying fire resistant material onto the tank walls, and allowing the said material to harden in situ to form a relatively lightweight shell enclosing the tank, said material applied closely adjacent said first and second means,

(e) said application step continued to provide shell thickness between about ¼ inch and 1 inch,

(f) said fire resistant material being characterized as charring in response to flame impingement thereon,

(g) the tank walls having thickness maintained between about ¼ inch and 1 inch,

(h) said fire resistant material being maintained free of retention to said tank by metallic bands with clips.

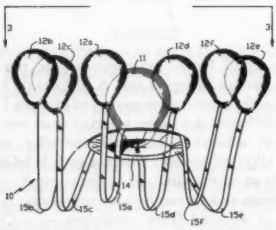
3. The method of claim 1 wherein said material has an epoxide resin base.

5,004,633

BALLOON DECORATIVE DEVICES, METHODS AND KITS

Craig J. Lovik, 8565 Custer School Rd., Custer, Wash. 98240

Filed May 24, 1989, Ser. No. 357,322
Int. Cl.[5] A63H *27/10*; B64B *1/40*
U.S. Cl. 428—9 21 Claims



1. An ornamental arrangement of decorative balloons comprising, in combination:

(a) a light-weight support element formed of paperboard in a plate configuration and sized to support a novelty item;

(b) a plurality of first decorative balloons inflated with a lighter-than air inflation medium, said plurality of first decorative balloons being independent of one another and capable of independent movement with respect to one another; and,

(c) a corresponding plurality of flexible streamers for securing said plurality of first decorative balloons to said support element with respective different ones of said streamers having a first inboard end secured to said support element at one of a plurality of points spaced about the periphery thereof and a second outboard end separably attached to the constricted neck portion of respective different ones of said plurality of first decorative balloons;

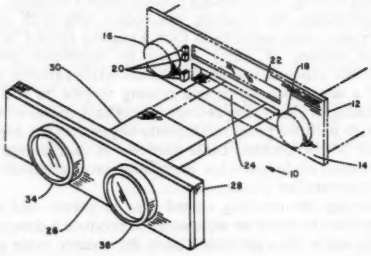
whereby said support element is suspended from said plurality of first decorative balloons and defines a hanging basket capable of supporting one or more stuffed animals, floral arrangements, gifts and similar novelty items.

5,004,634

PROTECTIVE COVER FOR AUTOMOTIVE TAPE PLAYER

Shane L. Anthony, 3140-K S. Peoria St., Ste. 257, Aurora, Colo. 80014

Filed Jan. 26, 1990, Ser. No. 470,969
Int. Cl.[5] F41H *3/00*
U.S. Cl. 428—31 20 Claims



1. A protective device for concealing the visible area of an automotive tape player mounted to a dashboard and having a tape cartridge opening and a plurality of control knobs, comprising:

a face plate sized to substantially cover the visible exterior portion of the tape player;

a generally tubular shaped extension member attached to said face plate and formed with a size and shape corresponding to said face plate and with a depth sufficient to enclose the control knobs of the tape player;

a mounting blank sized to be placed in the tape cartridge opening of the tape player;

adjustable fastening means for adjustably and hingedly attaching said mounting blank to said face plate such that said mounting blank may be inserted into the tape cartridge opening of the tape player and said face plate may be centered over the visible exterior portion of the tape player regardless of the positioning of the tape cartridge opening on the tape player and said face plate may be adjusted to conform to the dashboard, and said face plate may be folded flat against said mounting blank for storage.

5,004,635

CONTOURED LINER FOR PREASSEMBLED TIRE COMPONENTS

Stephen T. Griebling, Akron, Ohio, assignor to Bridgestone/-Firestone, Inc., Akron, Ohio

Filed Sep. 2, 1988, Ser. No. 239,907
Int. Cl.[5] B65D *85/671*
U.S. Cl. 428—33 13 Claims

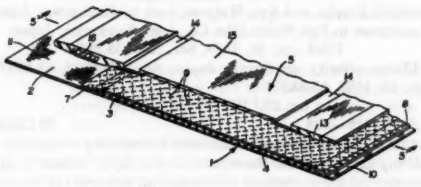
1. The combination of a strip of material having a sticky surface of the nature of unvulcanized rubber wherein said strip

is irregular in transverse contour having raised and depressed areas, and a separable liner thereon, said liner comprising:

(a) a flexible base formed of a woven fabric;

(b) a flexible cover formed of a knitted fabric extending generally coextensive with a portion of the base; and

(c) a compressible filler interposed between the base and



cover to provide the liner with an irregular transverse contour having raised and depressed areas which generally coincide with the depressed and raised areas, respectively, of the strip to form a generally symmetrical thickness transverse contour when placed in overlying relationship whereby said strip and liner form a general symmetrical roll when wound onto a supporting reel.

5,004,636

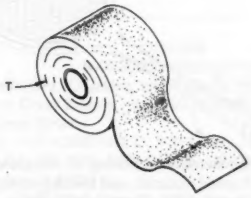
ROLL-TYPE TOILET TISSUE HAVING HEMORRHOID-TREATING MEDICATION THEREIN

Michael Parris, 39 Wilder Rd., Monsey, N.Y. 10952

Filed Jul. 20, 1989, Ser. No. 382,212

Int. Cl.[5] B32B *5/16*

U.S. Cl. 428—43 **1 Claim**



1. A roll of toilet tissue product comprising:

at least three layers;

one layer being sandwiched between the other two layers;

said one layer being formed of hemorrhoid treating medication including alcohol and powder; and

the other two layers comprising paper and having a porosity selected to permit said hemorrhoid-treating medication to flow therethrough for application by contact with the area to be treated.

5,004,637

SANITARY TEARING TOWEL

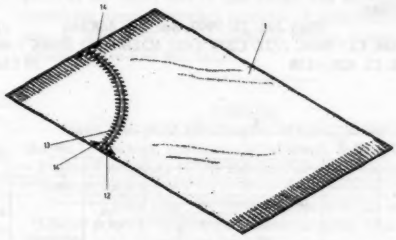
Chuen-Rong Liao, No. 10, Alley 3, Lane 127, Lei Chung St., Taichung City, Taiwan

Filed Aug. 17, 1989, Ser. No. 395,772

Int. Cl.[5] B32B *3/10*

U.S. Cl. 428—43 **2 Claims**

1. A sanitary tearing towel comprising at least one set of tearing lines defined by an area of weakness suitable for tearing, and tearing indication marks adjacent to said tearing lines indicating the position of said tearing lines, said tearing lines being provided to enable the severance of a portion of said towel to indicate previous use, wherein said tearing lines and



tearing indication marks are located in an arc near a corner of said sanitary tearing towel.

5,004,638

FABRIC LAMINATION OF UNITARY BACKED HOT CONSTRUCTED CARPET TILE

Raymond W. Goss, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 880,611, Jun. 30, 1986, abandoned. This application Jul. 1, 1987, Ser. No. 68,393

Int. Cl.[5] D03D *27/00;* **D04H** *11/00;* **D05C** *17/00*

U.S. Cl. 428—95 **10 Claims**

1. In a method for increasing flexibility and durability of carpet tile having

(a) a primary carpet facing component; and

(b) a tile backing component comprising a tile base and at least one intermediate characterizing component arranged between said tile base and said facing component;

the improvement comprising utilizing, as tile base, a flexible layer comprising an adhesive coating deficient in tile weight, strength and bulk; and

incorporating, as intermediate characterizing component of the tile backing component, at least one adhesive/scrim layer combination; said intermediate characterizing component providing a substantial amount of at least tile weight and strength complementary to said primary facing component and said tile base, to obtain desired carpet tile characteristics.

4. A carpet tile comprising, in combination,

(A) a primary tile facing component; and

(B) a tile backing component comprising

(1) an externally arranged flexible tile base comprising an adhesive layer;

(2) a characterizing component having at least one adhesive/scrim combination arranged intermediate said tile base and said primary facing component; and

(3) at least one adhesive or sizing layer arranged between said primary facing component and said characterizing component;

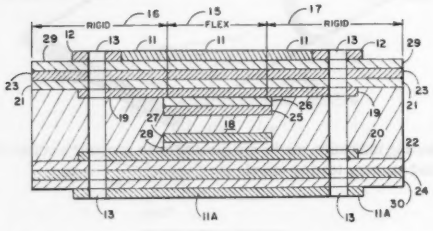
said characterizing component, alone or in combination with said adhesive layer, providing at least one of weight and strength complementary to said primary facing component and said flexible tile base to obtain the desired tile.

5,004,639

RIGID FLEX PRINTED CIRCUIT CONFIGURATION

Jay Dessai, Corona, Calif., assignor to Sheldahl, Inc., Northfield, Minn.

Filed Jan. 23, 1990, Ser. No. 468,646
Int. Cl.[5] B44C *1/22;* C23F *1/02;* B32B *3/10;* H05K *1/00*
U.S. Cl. 428—138 20 Claims



1. A process for fabricating a rigid-flex printed circuit structure having rigid and flexible sections comprising the steps of:

acquiring a first pair of conductor layers laminated on opposite surfaces of a central insulator layer wherein said insulator layer is further processed to be of a first composition in the rigid sections and of a second composition in the flexible section;

forming first conductor patterns in said first pair of conductor layers by imaging and etching;

laminating a first pair of dielectric film layers over said first conductor patterns in both said rigid and said flexible sections;

laminating a second pair of conductor layers on said pair of first dielectric film layers;

drilling holes through the rigid section;

plating through the holes with conductor material to form a conductive lining therein said lining connecting conductors in the conductor patterns of the conductor layers where they meet the holes.

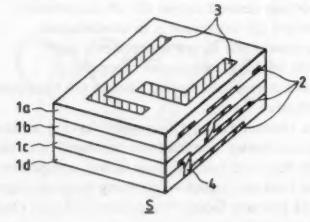
18. A multi-layer flexible circuit board made according to the process of claim 1.

5,004,640

MULTILAYERED CERAMIC SUBSTRATES AND METHOD FOR MANUFACTURING THE SAME

Seiichi Nakatani; Satoru Yuhaku, both of Osaka; Tsutomu Nishimura, Kyoto; Yukio Terada, Osaka, and Yasuyuki Baba, Niihama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 10, 1989, Ser. No. 321,702
Claims priority, application Japan, Mar. 11, 1988, 63-58752
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—195 5 Claims



1. A multilayered ceramic substrate which comprises a multilayered structure having electrode patterns of copper and ceramic layers laminated alternately, the ceramic layers consisting essentially of 45 to 60 wt % of Al_2O_3, 24 to 33 wt % of SiO_2, 2.4 to 3.3 wt % of B_2O_3, 1.2 to 1.65 wt % of Na_2O, 0.8 to 1.1 wt % of K_2O, 3.2 to 4.4 wt % of CaO, 1.2 to 1.65 wt % of MgO and 7.2 to 9.9 wt % of PbO.

5,004,641

ELECTROCONDUCTING SEMICONDUCTOR AND BINDER OR BINDER PRECURSOR COATED IN A SUBBING LAYER

Syunichi Kondo, and Syu Watarai, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 10, 1989, Ser. No. 335,357
Claims priority, application Japan, Apr. 11, 1988, 63-88377; Apr. 11, 1988, 63-88378
Int. Cl.[5] B32B *27/40, 27/38*
U.S. Cl. 428—208 20 Claims

1. An electroconductive element comprising a support, a subbing layer, and an electroconductive layer, where in said electroconductive element is transparent, wherein the electroconductive layer is formed by coating, on the subbing layer, a solution comprising:

(A) a compound semiconductor,

(B) a solvent dissolving the compound semiconductor, wherein said subbing layer is swelled by said solvent and

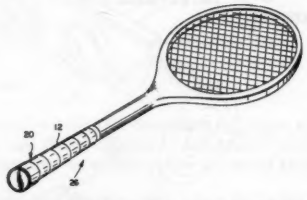
(C) a resin or a resin precursor soluble in the solvent selected from the group consisting of epoxy resins and isocyanate compounds.

5,004,642

SELF-ADHERENT FOAM WRAPPING MATERIAL

Janene Youngs, R.R. 4 P.O. Box 954, Harrisburg, Ill. 62946

Filed Aug. 16, 1990, Ser. No. 568,024
Int. Cl.[5] B32B *3/26*
U.S. Cl. 428—222 5 Claims



1. Wrapping material comprising an elongated strip formed of cushioned foamed material, said foamed material including a quantity of plasticizer incorporated therein in excess of the amount normally needed to soften the material wherein said strip adheres to itself and to an applied surface without use of a separate adhesive.

2. The wrapping material of claim 1 wherein said applied surface is a sporting equipment grip, said strip of sufficient tack to improve the grip of a user.

5,004,643

SILICONE POLYMER-INTERNALLY COATED WEBS

J. Michael Caldwell, Escondido, Calif., assignor to Sili-Tex, Inc., San Marcos, Calif.

Continuation-in-part of Ser. No. 167,630, Mar. 14, 1988, and a continuation-in-part of Ser. No. 167,643, Mar. 14, 1988, abandoned, and a continuation-in-part of Ser. No. 167,797, Mar. 14, 1988, abandoned, and a continuation-in-part of Ser. No. 167,869, Mar. 14, 1988, abandoned. This application Mar. 10, 1989, Ser. No. 319,778
Int. Cl.[5] B32B *5/32;* D06M *15/643, 15/70*
U.S. Cl. 428—246 27 Claims

1. A flexible porous web which has an internally located coating that is comprised of a curable silicone polymer composition, said coating being positioned in an approximately planar region extending through the web in a direction generally parallel to and spaced from at least one major surface thereof,

said web, upon curing the said curable composition thereof, being breathable and highly water repellent and exhibiting a hand and flexibility comparable to the hand flexibility of an untreated web.

24. A process for producing a porous web that is internally coated with a silicone polymer composition comprising the steps of continuously and successively;

(a) tensioning a porous web;

(b) uniformly applying, under pressure, to one surface of said tensioned web a curable silicone polymer composition; and

(c) applying a transverse shear force uniformly and laterally across and against said surface and concurrently wiping away excess portions of silicone polymer from said surface;

where, an internal layer of silicone polymer is formed in an approximately planar region extending through said web in a direction generally parallel to space from at least one major surface thereof.

5,004,644

SUPPORT MATERIAL FOR PHOTOGRAPHIC COATINGS

Ralf-Burkhard Dethlefs, Bissendorf; Bernd Scholz, Osnabruck; Wolfram Wysk, Belm, and Elke Miefert, Herford, all of Fed. Rep. of Germany, assignors to Felix Schoeller Jr. GmbH & Co. KG, Osnabruck, Fed. Rep. of Germany

Filed May 23, 1988, Ser. No. 197,454

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1987, 3720518

Int. Cl.[5] B32B *5/16;* **G03C** *1/85*

U.S. Cl. 428—323 **12 Claims**

1. Support material for photographic coatings comprising a paper or other film material coated on at least one side with a polyolefin resin coating, said polyolefin coating containing a fluorine containing polymer effective to facilitate separation of the coating from a chill roll during manufacture of the support material.

5,004,645

BARRIER PRODUCTS

Alan Tallentire, Cheshire, and Colin S. Sinclair, Manchester, both of Great Britain, assignors to DRG (UK) Limited, Bristol, Great Britain

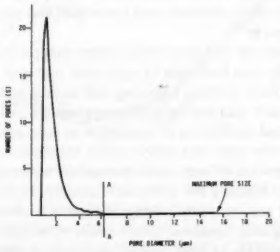
PCT No. PCT/GB87/00833, § 371 Date Jul. 13, 1989, § 102(e) Date Jul. 13, 1989, PCT Pub. No. WO88/03972, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 20, 1987, Ser. No. 381,675

Claims priority, application United Kingdom, Nov. 22, 1986, 8628808

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—323 **15 Claims**



1. An air-permeable barrier material comprising porous material having pores with a range of sizes wherein a pore modifying agent is selectively incorporated in a minor proportion of the total number of the pores, said minor proportion being at the upper end of said range of sizes; said modifying agent being such as to provide zones of high surface area within said pores at the upper end of said range in such a way as to restrict the passage of air-borne particles through said pores at the upper end of said range; and wherein the pore modifying agent comprises particles of substantially uniform size, at least 90% of said particles having diameters falling within a three-fold size range.

5,004,646

PROCESS FOR TREATING METAL SURFACES

Harold L. Benham, and James A. Mitchell, both of Middlesex, England, assignors to The British Petroleum Company p.l.c., London, England

Filed Mar. 14, 1989, Ser. No. 329,723

Claims priority, application United Kingdom, Mar. 19, 1988, 8806590

Int. Cl.[5] B32B *15/00, 7/12*

U.S. Cl. 428—344 **19 Claims**

1. A composite structure which comprises in sequence: (a) a metal article, (b) a layer of a compound of formula (I), (c) a layer of a polymer having adhesive properties and copolymerisable with the compound of formula (I).

5,004,647

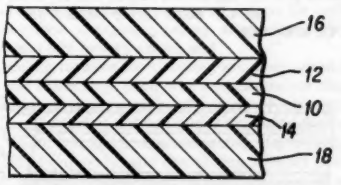
OXYGEN BARRIER BIAXIALLY ORIENTED FILM

Gautam P. Shah, Simpsonville, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Continuation of Ser. No. 842,321, Mar. 21, 1986, abandoned. This application May 27, 1988, Ser. No. 199,899

Int. Cl.[5] B30B *7/12*

U.S. Cl. 428—349 **7 Claims**



1. An oriented multilayer film comprising:

(a) a cross-linked core layer comprising an ethylene vinyl alcohol copolymer;

(b) two cross-linked interior layers each comprising an adhesive polymeric material; and

(c) two cross-linked outer layers each comprising a blend of (1) from about 70%, by weight, to about 80%, by weight of a linear low density polyethylene and (2) from about 20%, by weight, to about 30%, by weight, of a very low density polyethylene.

5,004,648

FIBER OF A FLUOROCARBON POLYMER AND A PROCESS FOR PRODUCING THE SAME

Toshioki Hane, Suzuka, and Shigeki Katayama, Yokohama, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 26, 1988, Ser. No. 236,926

Claims priority, application Japan, Aug. 26, 1987, 62-210336

Int. Cl.[5] D02G *3/00*

U.S. Cl. 428—364 **4 Claims**

1. A fiber of a fluorocarbon polymer having pendant groups represented by at least one formula selected from the group consisting of:

$$-SO_3X \text{ and } -CO_2X$$

wherein X is at least one member selected from the group

consisting of H, NH_4, an alkali metal and an alkaline earth metal,

said fiber having a tensile strength at break of at least 1.0 g/denier.

5,004,649

RESIN LAMINATES AND A PROCESS FOR PRODUCTION THEREOF

Komei Yamasaki, Sodegaura, and Keisuke Funaki, Ichihara, both of Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1989, Ser. No. 327,815

Claims priority, application Japan, Apr. 13, 1988, 63-89141; Nov. 26, 1988, 63-297221

Int. Cl.[5] B32B *15/08;* **B05D** *1/00*

U.S. Cl. 428—461 **8 Claims**

1. A metallized laminate comprising

a layer of styrene-based polymer having mainly syndiotactic configuration, said layer having two surfaces; and

a metal layer, said metal layer being disposed on a first of said surfaces.

5,004,650

RUBBER-COATED GASKET MATERIAL

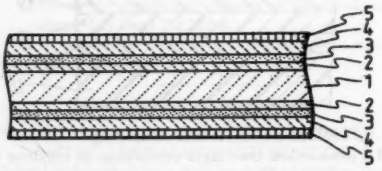
Masaaki Ashizawa; Kazuo Nishimoto; Atsushi Oomura, all of Kanagawa, and Shuji Ito, Saitama, all of Japan, assignors to Nichias Corporation, Tokyo, Japan

Filed May 11, 1989, Ser. No. 350,796

Claims priority, application Japan, Jul. 19, 1988, 63-179844

Int. Cl.[5] B32B *15/06;* **B05D** *1/36*

U.S. Cl. 428—463 **5 Claims**



1. In a rubber-coated gasket material which has a rubber layer formed on one or both sides of a metal sheet, the improvement wherein said rubber layer has incorporated therein a nitrile rubber containing a carboxyl group in such an amount that the proportion of a carboxylic monomer as calculated in term as of a monomer content in the rubber component is in the range of 2–15 wt. % and which rubber layer is formed in a thickness of 10–300 μm per side, and bonded to a metal sheet with a primer layer based on a phenolic resin being interposed between the rubber layer and the metal sheet.

5,004,651

STABILIZING SYSTEM FOR SOLID DOSAGE FORMS

Wallace E. Becker, Franksville, Wis., assignor to Abbott Laboratories, Abbott Park, Ill.

Filed Jan. 24, 1989, Ser. No. 301,579

Int. Cl.[5] A61K *9/20*

U.S. Cl. 424—465 **14 Claims**

1. A pharmaceutical preparation in a solid dosage form comprising estropipate and tromethamine in a weight ratio of estropipate to triomethamine from about 0.375 to about 6.0

5,004,652

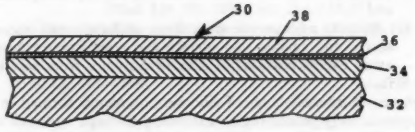
HIGH-COERCIVITY THIN-FILM RECORDING MEDIUM AND METHOD

Brij B. Lal, San Jose, and Atef H. Eltoukhy, Saratoga, both of Calif., assignors to HMT Technology Corporation, Fremont, Calif.

Filed Aug. 15, 1990, Ser. No. 567,598

Int. Cl.[5] G11B *5/62, 5/70, 5/66*

U.S. Cl. 428—611 **10 Claims**



1. A magnetic recording medium comprising

a substrate;

a1. sputtered chromium underlayer on the substrate; and

a sputtered magnetic layer composed of an alloy containing between 70–80 atom percent cobalt, 10–20 atom percent chromium, atom percent platinum, and $2 \geqq 10$ atom percent tantalum, on the chromium underlayer.

5,004,653

PRELIMINARY MATERIAL FOR THE PRODUCTION OF COMPOSITE MATERIAL PARTS AND METHOD OF MAKING

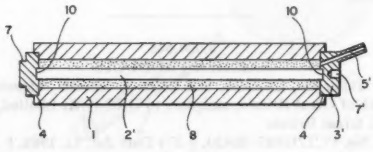
Walter Kroisenbrunner, Kapfenberg, Austria, assignor to Boehler Ges. m.b.H., Kapfenberg, Austria

Filed Oct. 5, 1989, Ser. No. 416,676

Claims priority, application Austria, Oct. 7, 1988, 2479/88

Int. Cl.[5] B32B *15/00*

U.S. Cl. 428—615 **20 Claims**



1. Preliminary material for the production of composite material parts by hot-forming treatment or hot isostatic pressing treatment, comprising:

a tubular outer part;

stepped ends on said tubular outer part forming sealing surfaces at said ends and having a smaller dimension than the outer diameter of said outer part;

at least one inner part within said outer part;

a residual cavity between said outer part and said at least one inner part;

sealing parts at said ends of said outer part projecting at least partially into said ends of said outer part and having sealing surfaces thereon engaging said sealing surfaces on said outer part, said sealing parts comprising a material having a thermal coefficient of expansion at least equal to that of said outer part and deformation resistance substantially equal to that of said outer part at the treatment temperature for forming the composite material, and said material of said sealing parts having a distortion temperature exceeding said treatment temperature by at least 90° C.; and

a roughness on at least one of said sealing surfaces of said outer member and said sealing surfaces of said sealing parts;

so that a surface pressure exists at said sealing surfaces when said sealing parts and outer part are at substantially the same temperature.

5,004,654

ALUMINIUM BATTERIES

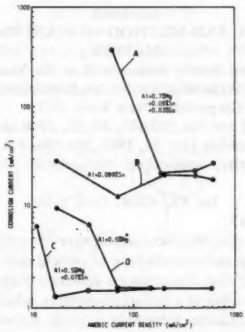
John A. Hunter, Banbury; Geoffrey M. Scamans, Cropredy, both of England; Wilfred B. O'Callaghan, and Paul A. Wycliffe, both of Kingston, Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Aug. 4, 1989, Ser. No. 389,619

Claims priority, application United Kingdom, Aug. 9, 1988, 8818857; Mar. 23, 1989, 8906777

Int. Cl.[5] H01M *4/24, 4/46*

U.S. Cl. 429—50 10 Claims



1. An aluminum battery comprising a cathode, an aqueous alkaline electrolyte and an anode which is an alloy of aluminum containing 0.01–5% of magnesium and/or 0.01–0.05% calcium but no added gallium, wherein at least one of the electrolyte and the anode contains tin, any tin in the electrolyte being present as stannate at a concentration of 0.001 to 0.01M and any tin in the anode being present at a concentration of greater than 0.005%.

5,004,655

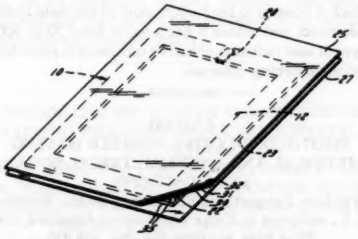
THIN BIPOLAR LEAD-ACID BATTERY WITH INDIVIDUAL CELL VENT

James S. Symanski, Grafton, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed Dec. 14, 1989, Ser. No. 450,550

Int. Cl.[5] H01M *2/12, 2/14*

U.S. Cl. 429—82 17 Claims



1. A battery cell including a vent for permitting the escape of gases from said cell and for preventing the entry of moisture or oxygen into said cell, said cell comprising:

a spacer comprising a rigid member having generally planar surfaces and a cut out portion whereby a frame is formed, at least one passageway extending through said member;

film sheeting covering both of said surfaces of said member and extending beyond the periphery thereof;

means for adhering said sheeting to said member; and

means for joining said film sheeting to each other except at the extending area adjoining said passageway.

5,004,656

FLAT TYPE SEALED BATTERY WITH HERMETIC SEALING STRUCTURE

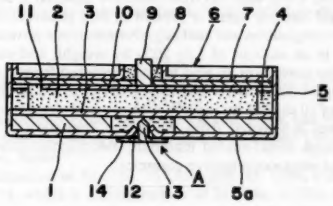
Kiyoshi Sato; Hirokazu Yoshikawa, both of Ibaraki; Shigeru Ikenari, Suita, and Kenichi Yokoyama, Takatsuki, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Aug. 28, 1989, Ser. No. 400,165

Claims priority, application Japan, Aug. 29, 1988, 63-214575; Aug. 29, 1988, 63-214576; Aug. 29, 1988, 63-214580; Aug. 29, 1988, 63-214581

Int. Cl.[5] H01M *2/08*

U.S. Cl. 429—162 2 Claims



1. A flat disc type sealed battery comprising

a batter vessel having a bottom wall with a taper cylindrically shaped electrolyte charging opening formed in the central portion thereof including an aperture in a side of a lower edge portion of said electrolyte charging opening,

a battery lid member for covering an upper opening of said batter vessel,

power generating components of said batter which are enclosed by sealing said batter vessel and battery lid member,

a first sealing member having a tapered shaped for sealing said electrolyte charging opening after electrolyte is charged into said battery vessel, and

a second sealing member for covering said aperture in the side of said lower edge portion of said electrolyte charging opening, an outer peripheral portion of said second sealing member being welded to said bottom wall of said battery vessel, said first and second sealing members being connected as one body, said first sealing member having an outer diameter greater than an inner diameter of said electrolyte charging opening.

5,004,657

BATTERY

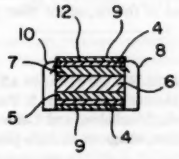
Tetsuya Yoneda, Tenri, and Shin Sato, Kashihara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 242,613, Sep. 9, 1988, abandoned. This application Dec. 12, 1989, Ser. No. 449,450

Claims priority, application Japan, Sep. 9, 1987, 62-225977

Int. Cl.[5] H01M *4/52, 10/36*

U.S. Cl. 429—193 4 Claims



1. A battery comprising a cell tablet and a pair of current collector plates disposed respectively on the upper face and lower face of said cell tablet; said cell tablet having a positive-electrode powder composition, a solid electrolyte powder composition, and a negative-electrode powder composition in this order, and further having an electron-conductive means in

the inside or on the surface of at least one of said positive-electrode powder composition and said negative-electrode powder composition, wherein said cell tablet is formed into a four- or five-layered tablet by the application of pressure, thereby reducing the internal resistance of said battery; wherein said positive-electrode powder composition comprises a positive active material, an electroconductive material, a binding agent, and a solid electrolyte; said negative-electrode powder composition comprises a negative active material, an electroconductive material, a binding agent, and a solid electrolyte; and said solid electrolyte powder composition comprises a solid electrolyte; wherein said positive active material is manganese dioxide or nickel oxide; said negative active material is selected from the group consisting of TiNi, $TiNiB_{0.01}$, $TiNiMm_{0.01}$, $LaNi_5$, and TiFe; said electroconductive material is acetylene black; said binding agent is present in said positive-electrode powder composition and said negative-electrode powder composition in an amount of 3 to 20% by weight; and said solid electrolyte comprises an acid hydrate selected from the group consisting of $SnO_2 \cdot 3H_2O$ and $Sb_2O_5 \cdot nH_2O$ (n=3 to 6), in an amount of 10 to 60% by weight; wherein said electron-conductive means is selected from the group consisting of metals, metal alloys, metal-coated materials, electroconductive polymers, and electroconductive ceramics.

5,004,658

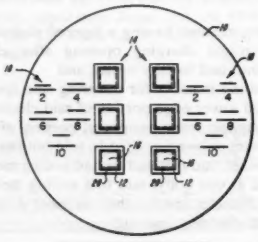
ADJUSTMENT OF THIN FILM CAPACITORS

Richard A. Hjulstrom, Kingston, N.Y., assignor to Electro-Films, Inc., Warwick, R.I.

Division of Ser. No. 210,034, Jun. 22, 1988, Pat. No. 4,894,316. This application Jun. 12, 1989, Ser. No. 365,086

Int. Cl.[5] G03F *1/00, 9/00*

U.S. Cl. 430—5 3 Claims



1. For use in a system for adjusting during fabrication the capacitance value of thin film capacitors formed on a substrate and having metallized capacitor plates, a mask comprising:

a first plurality of patterns each defining a selected metallized area on the substrate to form a corresponding capacitor plate on the substrate; and

a second plurality of patterns for defining a corresponding plurality of adjustment patterns on the substrate, the second plurality of patterns being cooperative with adjustment patterns formed on the substrate to provide a selected offset of the capacitor plate metallized areas on the substrate with said first plurality of patterns for removal of selected portions of the capacitor plate metallized areas.

5,004,659

DYE IMAGE RECEIVING MATERIAL

Leon L. Vermeulen, Herenthout; Robert S. Pauwels, Brasschaat; Willy P. De Smedt, Mechelen, and Ludovicus H. Vervloet, Kessel, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Mar. 19, 1990, Ser. No. 495,159

Claims priority, application European Pat. Off., Mar. 20, 1989, EP89200708.9

Int. Cl.[5] G03C *5/54*

U.S. Cl. 430—14 11 Claims

9. A laminar article comprising a dye image in an image receiving layer which is enveloped between a vinyl chloride polymer support and a resin cover sheet fixed to the image receiving layer by lamination using pressure and heat, wherein said image receiving layer is free from gelatin and contains (1) a cationic polymeric mordant, and (2) colloidal silica applied from an aqueous acidic colloidal sol having a pH of not more than 4, and containing hydrated silica in combination with a smaller amount of colloidal aiumina, the amount of said colloidal material to said mordant in the image-receiving layer being in a weight ratio range from 1/5 to $\frac{1}{2}$, and silica (SiO_2) being present at a coverage of at least 0.5 g per m2.

5,004,660

MASTER DISC AND METHOD OF MANUFACTURING A MATRIX

Maarten A. Van Andel; Johannes P. J. G. Van Liempd, and Josephus M. Wijn, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

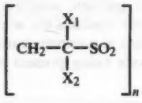
Continuation of Ser. No. 223,457, Jul. 21, 1988, abandoned. This application Oct. 17, 1989, Ser. No. 425,382

Claims priority, application Netherlands, Jul. 23, 1987, 8701736

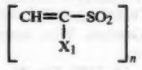
Int. Cl.[5] G03C *1/00, 3/00*

U.S. Cl. 430—17 9 Claims

1. A master disc for the manufacture of matrices which in turn are used in the manufacture of optical information carriers, said master disc comprising a substrate plate provided on one side with a layer of a radiation-sensitive substance in which an optically readable information track formed of pits or grooves is provided, said radiation-sensitive substance being a polysulphone which corresponds to the formula



or



where X_1 and X_2 are equal or unequal and each represent a hydrogen atom, an alkyl group having 1 to 6 carbon atoms or an aryl group, or where they together represent one substituent, which is bonded to the carbon atom of the main chain with a double bond, and where n has a value from 50 to 5000 and said layer of said radiation-sensitive substance is provided with a radiation-absorbing colorant.

5,004,661

PHOTOCONDUCTIVE MEMBER HAVING SYMMETRICAL AND UNSYMMETRICAL SQUARAINE COMPOSITIONS

Kock-Yee Law, Fairport, and F. Courtney Bailey, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 30, 1989, Ser. No. 358,930

Int. Cl.[5] G03G *5/06*

U.S. Cl. 430—59 23 Claims

1. A photoconductive imaging member comprised of a photogenerating layer comprised of the squaraine compounds obtained by a process which comprises a cycloaddition, reduction alkylation and condensation reaction wherein there is reacted a nitroarylacetyl halide with a tetraalkoxy olefin and a trialkylamine in a solvent, followed by the reaction of the resulting nitroaryl dione with hydrogen in the presence of an aldehyde and a catalyst in a solvent; and thereafter reacting the

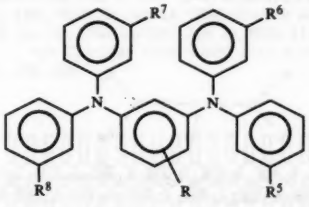
formed dialkylaminoaryl hydroxycyclobutene dione with N,N-dialkylaniline in an alcohol, and a hole transport layer.

5,004,662
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIAL CONTAINING M-PHENYLENEDIAMINE COMPOUND

Nariaki Mutoh, Daito; Yasuyuki Hanatani, Sakai, and Toshihiko Nishiguchi, Moriguchi, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jul. 27, 1989, Ser. No. 385,433
Claims priority, application Japan, Jul. 27, 1988, 63-187312
Int. Cl.[5] G03G *5/09*
U.S. Cl. 430—59 7 Claims

1. An electrophotographic photosensitive material containing in a photosensitive layer an m-phenylenediamine compound represented by the following general formula [I]:



(I)

wherein R^5, R^6, R^7 and R^8 are groups substituted at meta-positions to the nitrogen atoms and represent a hydrogen atom, an alkyl group, an alkoxyl group or a halogen atom, with the proviso that at least two of R^5, R^6, R^7 and R^8 represent an alkyl group, alkoxyl group or a halogen atom, and R represents a hydrogen atom, an alkyl group, an alkoxyl group or a halogen atom.

5,004,663
PHOTOCONDUCTIVE IMAGING MEMBERS WITH POLYPHOSPHAZENE BINDERS

Santokh S. Badesha, Pittsford; Milan Stolka; Damodar M. Pai, both of Fairport, and Martin A. Abkowitz, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 28, 1989, Ser. No. 386,322
Int. Cl.[5] G03G *5/047*
U.S. Cl. 430—59 38 Claims

1. A photoconductive imaging member comprised of a photogenerating layer, and a hole transport layer containing a polyphosphazene resinous binder.

5,004,664
TONER AND DEVELOPER COMPOSITIONS CONTAINING BIODEGRADABLE SEMICRYSTALLINE POLYESTERS

Timothy J. Fuller, West Henrietta, N.Y.; Robert H. Marchessault, Montreal, and Terry L. Bluhm, Oakville, both of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 27, 1989, Ser. No. 316,070
Int. Cl.[5] G03G *9/087, 9/083*
U.S. Cl. 430—106.6 23 Claims

1. A toner composition comprised of biodegradable semicrystalline polyester resin particles and pigment particles.

2. A toner composition in accordance with claim 1 wherein the semicrystalline polyester is comprised of a polyhydroxyalkanoate, copolymers thereof, or blends of polyhydroxyalkanoates and pigment particles.

6. A toner composition in accordance with claim 2 wherein the pigment particles are carbon black, magnetite, mixtures thereof, magenta, cyan, yellow, or mixtures thereof.

5,004,665
TONER CONTAINING POLYMERIC-MAGNETIC COORDINATION COMPLEX

Junji Ohtani; Masahiro Anno; Eiichi Sano; Junji Machida, and Fumio Masuda, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 278,780, Dec. 2, 1988, abandoned. This application Oct. 11, 1989, Ser. No. 420,722
Claims priority, application Japan, Dec. 2, 1987, 62-304965; Apr. 28, 1988, 63-106002; Apr. 28, 1988, 63-106003; Apr. 28, 1988, 63-106004
Int. Cl.[5] G03G *9/08*
U.S. Cl. 430—106.6 9 Claims

1. A toner for electrophotography comprising a resin, a colorant and a polymeric-magnetic coordination complex.

5,004,666
TONER FOR USE IN DEVELOPING ELECTROSTATIC IMAGES

Makoto Tomono, Hino; Noriyoshi Tarumi, Tama, and Masayuki Sato, Ohtsuki, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 147,024, Jan. 19, 1988, Pat. No. 4,921,771, which is a continuation of Ser. No. 65,093, Jun. 18, 1987, abandoned, which is a continuation of Ser. No. 801,376, Nov. 22, 1985, abandoned, which is a continuation of Ser. No. 550,992, Nov. 14, 1983, abandoned, which is a continuation of Ser. No. 279,673, Jul. 1, 1981, abandoned, which is a continuation of Ser. No. 50,475, Jun. 20, 1979, abandoned, which is a continuation of Ser. No. 741,408, Nov. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 408,008, Oct. 19, 1973, abandoned. This application Mar. 29, 1990, Ser. No. 501,611
Claims priority, application Japan, Oct. 21, 1972, 47-104865; Oct. 23, 1972, 47-105289
The portion of the term of this patent subsequent to May 1, 2007, has been disclaimed.
Int. Cl.[5] G03G *9/08*
U.S. Cl. 430—110 13 Claims

1. A toner for developing electrostatic images comprising

(a) a styrene homopolymer or copolymer of styrene with at least one acrylic comonomer, and

(b) about 1.0 to about 10 parts by weight of polypropylene per 100 parts by weight of said styrene homopolymer or copolymer, said polypropylene having a number average molecular weight of about 3,000 to about 4,000.

5,004,667
PHOTOSENSITIVE MATERIAL, AND IMAGE FORMATION PROCESS AND IMAGE FORMATION APPARATUS USING SAME

Kozo Arahara; Tetsuro Fukui; Hiroshi Fukumoto, all of Kawasaki; Masato Katayama, Yokohama, and Yoshio Takasu, Tama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1988, Ser. No. 281,757
Claims priority, application Japan, Dec. 15, 1987, 62-317116
Int. Cl.[5] G03C *11/12*
U.S. Cl. 430—255 11 Claims

1. An image formation process comprising the steps of:

(a) subjecting a non-adhesive photosensitive material capable of becoming adhesive in response to light exposure and heat development comprising a silver halide, an organic silver salt, a reducing agent and a polymer which is capable of becoming adhesive at room temperature due to pH change, to imagewise exposure to form a latent image;

(b) heating said photosensitive material to promote a change in the pH value of said polymer to form an adhesive pattern of said photosensitive material corresponding to said imagewise exposed pattern;

(c) electrifying said photosensitive material to amplify said change in the pH value; and

(d) transferring said adhesive pattern corresponding to said imagewise exposed pattern of said material to a transferring medium.

5,004,668

IMAGE-RECEIVING SHEET MATERIAL AND PROCESS FOR THE FORMATION OF TRANSFERRED IMAGE

Tomizo Namiki; Tamotsu Suzuki, and Masashi Katayama, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 16, 1990, Ser. No. 494,295

Claims priority, application Japan, Mar. 17, 1989, 1-65067

Int. Cl.[5] G03C *1/90, 11/12;* **B32B** *27/32;* **C09J** *7/02*

U.S. Cl. 430—256 **8 Claims**

1. An image-receiving sheet material which is used in a transfer image-formation process comprising: (A) transferring an image formed on an image-forming layer of a transferable and light-sensitive material onto an image-receiving sheet material, and then (B) retransferring said image from said image-receiving sheet material onto a permanent support, wherein said image-receiving sheet material comprises: (1) a support, and (2) provided thereon an image-receiving layer which comprises at least two layers each comprising a composition containing an organic high polymer, wherein at least one of at least two layers of said image-receiving layer is to be transferred onto the permanent support and which contains a matting agent comprising a composite three-dimensional resin particles prepared by a process comprising at least: (a) emulsion-polymerizing a polyfunctional monomer having at least two unsaturated groups differing in copolymerizabiity from each other with a polymerizable monomer containing a crosslinkable monomer capable of reacting with one of said at least two unsaturated groups of said polyfunctional monomer to obtain three-dimensional resin particles in which another of said at least two unsaturated groups of said polyfunctional monomer remains, and (b) forming a substantially linear polymer chain by graft-polymerizing at least one radical-polymerizable monomer capable of reacting with said another of said at least two unsaturated groups of said polyfunctional monomer.

8. A process for the formation of a transferred image comprising: (1) transferring an image formed on an image-forming layer made of a transferable and light-sensitive material onto an image-receiving sheet material of claim 1, and then (2) retransferring said image onto a permanent support.

5,004,669

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Taketoshi Yamada; Takeshi Habu, and Yasuhiko Takamuki, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Oct. 27, 1989, Ser. No. 427,694

Claims priority, application Japan, Oct. 31, 1988, 63-276552; Oct. 31, 1988, 63-276560; Dec. 27, 1988, 63-332038; Dec. 28, 1988, 63-330854; Dec. 28, 1988, 63-330863

Int. Cl.[5] G03C *1/06, 1/84*

U.S. Cl. 430—264 **26 Claims**

1. A light sensitive silver halide photographic material comprising:

a transparent support having an upper surface and a lower surface and having

a silver halide emulsion layer on the upper surface, and having on the lower surface

a first subbing layer containing a latex polymer,

a second non-gelatin layer containing a conductive polymer, and

a third gelatin layer containing a conductive polymer and a backing dye, wherein said lower surface of the support is subjected to corona discharge treatment.

5,004,670

HIGH-CONTRAST DEVELOPMENT PROCESS FOR SILVER HALIDE PHOTOGRAPHIC MATERIAL

Eiichi Okutsu; Mitsunori Hirano, and Morio Yagihara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 6, 1989, Ser. No. 306,422

Claims priority, application Japan, Feb. 5, 1988, 63-25484; Feb. 10, 1988, 63-29622; Feb. 23, 1988, 63-40480

Int. Cl.[5] G03C *5/26, 5/30*

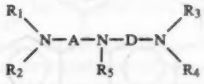
U.S. Cl. 430—265 **3 Claims**

1. A high-contrast development process which comprises subjecting a silver halide photographic material to light and developing the exposed silver halide photographic material containing at least a hydrazine derivative with a developer having a pH of from 10.0 to 12.3 and containing:

(a) a dihydroxybenzene developing agent;

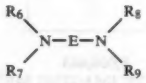
(b) at least 0.3 mol/liter of a sulfite, and

(c) at least one of the compounds represented by formulae (I-1), (I-2), (I-3), or (I-4);



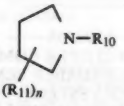
(I-1)

wherein R_1, R_2, R_3, R_4, R_5 each represents an alkyl goup having from 1 to 5 carbon atoms or a hydroxyalkyl group, provided that R_1 and R_2, or R_3 and R_4 may combine with each other to form a nitrogen-containing heterocyclic ring; and A and D each represents a substituted or unsubstituted alkylene group;



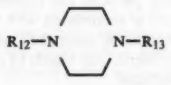
(I-2)

wherein R_6, R_7, r_8, and R_9 each represents an alkyl group having from 1 to 5 carbon atoms or a hydroxyalkyl group, provided that the R_6 and R_7, or R_8 and R_9 may combine with each other to form a nitrogen-containing heterocyclic ring, and E represents a substituted or unsubstituted alkylene group,



(I-3)

wherein R_{10} represents a hydroxyalkyl group; R_{11} represents a hydrogen atom or an alkyl group; and n represents an integer of from 0 to 3, and



(I-4)

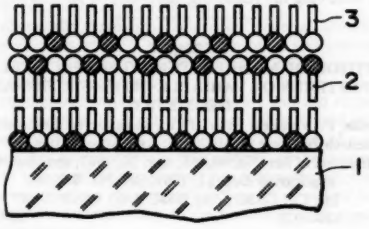
wherein R_{12} represents an unsubstituted alkyl group and R_{13} represents a hydroxyalkyl group.

5,004,671

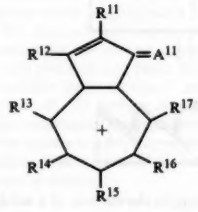
OPTICAL RECORDING MEDIUM AND OPTICAL RECORDING METHOD

Yukuo Nishimura, Sagamihara; Ken Eguchi, Atsugi; Haruki Kawada, Atsugi; Yoshinori Tomida, Atsugi; Takashi Nakagiri, Tokyo; Kenji Saito, Tokyo; Toshiaki Kimura, Sagamihara; Hiroshi Matsuda, Atsugi; Kunihiro Sakai, Yamato, and Toshihiko Miyazaki, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 899,909, Aug. 25, 1986, abandoned.
This application Dec. 20, 1988, Ser. No. 287,551
Claims priority, application Japan, Aug. 27, 1985, 60-187735; Aug. 27, 1985, 60-187737; Aug. 27, 1985, 60-187739; Dec. 3, 1985, 60-270786; Dec. 3, 1985, 60-270789; Dec. 4, 1985, 60-271349; Dec. 13, 1985, 60-281636; Dec. 13, 1985, 60-281637; Dec. 13, 1985, 60-281638; Dec. 16, 1985, 60-282211; Dec. 16, 1985, 60-282213; Dec. 25, 1985, 60-290483; Dec. 25, 1985, 60-290484; Dec. 25, 1985, 60-290487; Dec. 25, 1985, 60-290488; Dec. 26, 1985, 60-291902; Dec. 26, 1985, 60-291904; Dec. 26, 1985, 60-291905; Jan. 8, 1986, 61-675; Jan. 9, 1986, 61-1332; Jan. 13, 1986, 61-3675; Jan. 14, 1986, 61-4175; Jan. 20, 1986, 61-7839; Jan. 20, 1986, 61-7840; Jan. 29, 1986, 61-15859
Int. Cl.[5] G03F 7/025; G03C 1/72, 5/16
U.S. Cl. 430—286 52 Claims

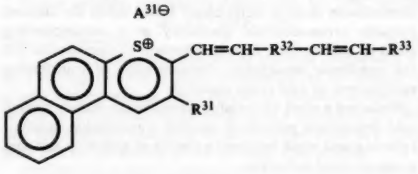


1. An optical recording medium comprising a diacetylene compound and at least one compound selected from the group consisting of: (i) azulenium salt compounds, represented by the formula (II):



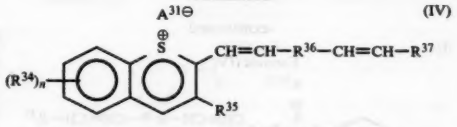
(II)

wherein R^{11} to R^{17} each represent a hydrogen atom, a halogen atom or a monovalent organic radical, and A^{11} represents a divalent organic radical; (ii) diene compounds represented by the formula (III) or the formula (IV) shown below:



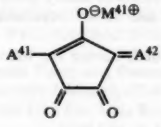
(III)

-continued



(IV)

wherein R^{31} represents an alkyl group, a phenyl or styryl group which may have a substituent, R^{32} and R^{36} represent arylene groups which may have a substituent for forming conjugated double bond systems with the two adjacent —CH=CH— groups, R^{33} and R^{37} represent phenyl or naphthyl groups which may have a substituent, R^{34} represents an alkoxy group, R^{35} represents an alkyl group and $A^{31}\ominus$ represents an anion residue; and (iii) croconic methine compounds having the following basic structure:



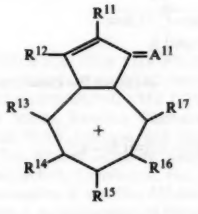
wherein $M^{41}\oplus$ represents a cation and A^{41} and A^{42} represent substituents containing an aromatic ring and/or a heterocyclic ring; wherein either said diacetylene or at least one compound selected from the group consisting of said azulenium salt compounds, diene compounds, and croconic methine compounds has a Langmuir-Blodgett film structure.

11. An optical recording method comprising:

(a) a step of irradiating a diacetylene compound with a polymerizing radiation to form a polydiacetylene compound; and

(b) a step of writing onto an optical recording medium by irradiating with a radiation beam corresponding to recording information, said recording medium containing said polydiacetylene compound and at least one compound selected from the group consisting of

(i) azulenium salt compounds represented by the formula (II):

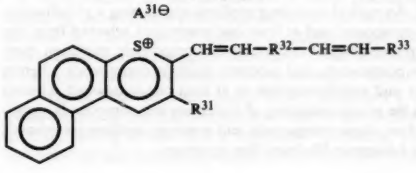


(II)

wherein R^{11} to R^{17} each represent a hydrogen atom, a halogen atom or a monovalent organic radical, and A^{11} represents a divalent organic radical;

(ii) diene compounds represented by the formula (III) or the formula (IV) shown below:

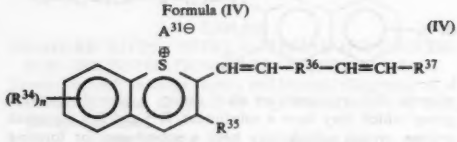
Formula (III)



(III)

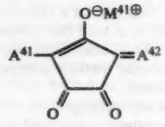
-continued

Formula (IV)



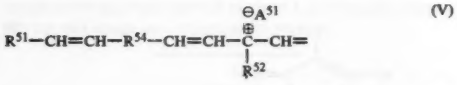
wherein R^{31} represents an alkyl group, a phenyl or styryl group which may have a substitutent, R^{32} and R^{36} represent arylene groups which may have a substitutent for forming conjugated double bond systems with the two adjacent —CH=CH— groups, R^{33} and R^{37} represent phenyl or naphthyl groups which may have a substitutent, R^{34} represents an alkoxy group, R^{35} represents an alkyl group and $A^{31(-)}$ represents an anion residue;

(iii) croconic methine compounds having the following basic structure:

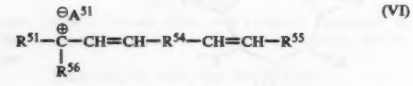


wherein $M^{41(+)}$ represents a cation and A^{41} and A^{42} represent substituents containing an aromatic ring and/or a heterocyclic ring; and

(iv) polymethine compounds represented by the formula (V) or the formula (VI) shown below:



(V)



(VI)

wherein R^{51}, R^{52} and R^{53} each independently represent an aryl group which may have a substituent, R^{54} and R^{55} represent arylene groups which may have a substituent for forming conjugated double bond systems with the adjacent two —CH=CH— groups, R^{56} represents hydrogen or an aryl group which may have a substituent and $A^{51(-)}$ represents an anion residue to cause color change of the polydiacetylene compound.

22. An optical recording medium, comprising a polydiacetylene compound and at least one compound selected from the group consisting of azulenium salt compounds, pyrylium dyes, diene compounds, and croconic methine compounds wherein either said polydiacetylene or at least one compound selected from the group consisting of azulenium salt compounds, pyrylium dyes, diene compounds, and croconic methine compounds has a Langmuir-Blodgett film structure.

5,004,672

ELECTROPHORETIC METHOD FOR APPLYING PHOTORESIST TO THREE DIMENSIONAL CIRCUIT BOARD SUBSTRATE

Eugene D. D'Ottavio, Sudbury; Robert E. Hawkins, Northboro; Stephen S. Rodriguez, Monument Beach, and James Rychwalski, Medway, all of Mass., assignors to Shipley Company Inc., Newton, Mass.

Filed Jul. 10, 1989, Ser. No. 377,123

Int. Cl.[5] G03C *1/68, 5/00*

U.S. Cl. 430—314 **5 Claims**

1. A process for forming a three dimensional circuit board comprising the steps of:

(a) providing a molded three dimensional circuit board substrate free of metal on its surface;

(b) metallizing the three dimensional surface of the circuit board substrate;

(c) building up the metallized surface with a metal selected from the group of copper, nickel, tin or mixtures thereof;

(d) electrophoretically applying a photoresist composition to the built up, metallized surface whereby photoresist is evenly deposited on all surfaces of the metallized surface;

(e) exposing and developing the photoresist in a desired image pattern;

(f) removing metal bared by development by contact with an etchant; and

(g) removing the remaining undeveloped photoresist.

5,004,673

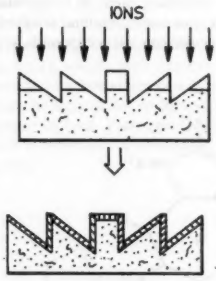
METHOD OF MANUFACTURING SURFACE RELIEF PATTERNS OF VARIABLE CROSS-SECTIONAL GEOMETRY

Nickolas P. Vlannes, Troy, N.Y., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Continuation of Ser. No. 40,055, Apr. 20, 1987, abandoned. This application Dec. 12, 1989, Ser. No. 449,644

Int. Cl.[5] G03C *5/00;* **B44C** *1/00;* **G02B** *5/18*

U.S. Cl. 430—325 **20 Claims**



1. A method of manufacturing in the surface of a solid substrate a three-dimensional surface relief pattern of desired variable cross-sectional geometry, comprising the steps of:

(a) depositing on said surface of said substrate a uniform thickness layer of radiation-sensitive resist material;

(b) determining a pattern of transmission density for each point of a mask of variable transmission density said transmission density for each point of said mask of variable transmission density determined based upon the desired variable cross-sectional geometry at a corresponding point of said surface of said substrate to compensate for the non-linear absorption characteristics of transferring said pattern to said resist material;

(c) producing a mask of variable transmission density having said determined pattern of variable transmission density;

(d) placing said mask between a source of radiation and said resist-covered substrate;

(e) exposing said mask and said resist-covered substrate to radiation;

(f) chemically developing said resist material, thereby removing a portion of said resist material and leaving remaining resist material corresponding to said pattern of variable transmission density; and

(g) etching said surface of said substrate and said remaining resist material by bombarding said substrate and said remaining resist material with a directional beam of reactive ions until said remaining resist material has been removed and a portion of said substrate has been removed, thereby forming a three-dimensional surface relief pattern in said substrate corresponding to the pattern of said remaining resist material.

11. A method of manufacturing in the surface of a solid substrate a three-dimensional surface relief pattern of desired variable cross--sectional geometry, comprising the steps of:

(a) depositing on said surface of said substrate a uniform thickness layer of radiation-sensitive resist material;

(b) determining a pattern of exposure intensity for each point of said resist material, said exposure intensity for each point of said resist material determined based upon the desired variable cross-sectional geometry at a corresponding point of said surface of said substrate to compensate for the non-linear absorption characteristics of transferring said pattern to said resist material;

(c) exposing said resist-covered substrate to radiation having said pattern of exposure intensity;

(d) chemically developing said resist material, thereby removing a portion of said resist material and leaving remaining resist material corresponding to said pattern of exposure intensity; and

(g) etching said surface of said substrate and said remaining resist material by bombarding said substrate and said remaining resist material with a directional beam of reactive ions until said remaining resist material has been removed and a portion of said substrate has been removed, thereby forming a three-dimensional surface relief pattern in said substrate corresponding to the pattern of said remaining resist material.

20. In a method of manufacturing in the surface of a solid substrate a three-dimensional surface relief pattern of desired variable cross--sectional geometry including the steps of depositing a uniform thickness layer of radiation-sensitive resist material on the substrate, exposing the resist-covered substrate to a pattern of radiation, chemically developing the exposed resist material, and etching the surface of the substrate and the remaining resist material with a directional beam of reactive ions, the improvement comprising the step of:

determining the pattern of radiation exposure intensity for each point of said resist material based upon the desired variable cross-sectional geometry at a corresponding point of said surface of said substrate to compensate for the non-linear absorption characteristics of transferring the pattern to the resist material and to compensate for the unequal etch rates of the substrate and the resist material during etching.

5,004,674

SILVER HALIDE PHOTOSENSITIVE MATERIAL

Keiichi Adachi; Kazunobu Katoh, both of Kanagawa, and Kouichi Kawamura, Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 13, 1989, Ser. No. 421,024

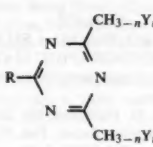
Claims priority, application Japan, Oct. 14, 1988, 63-258562

Int. Cl.[5] G03C *1/46*

U.S. Cl. 430—333 **6 Claims**

1. A silver halide photosensitive material comprising a support having thereon a layer containing (a) an organic compound which releases a free radical on contact with light rays and (b) a compound which undergoes a change in the absorption spectrum by changing from a colored state to a colorless state due to the action of the released free radical,

wherein the organic compound which releases a free radical on contact with light is a compound shown by the general formula (I):



(I)

wherein Y represent Cl or Br, n is an integer from 1 to 3, and R represents an aromatic group which may or may not be substituted, and

wherein the compound which changes from a colored state to a colorless state is an oxonol dye or a benzylidene dye.

5,004,675

METHOD FOR PROCESSING A SILVER HALIDE PHOTOSENSITIVE MATERIAL FOR COLOR PHOTOGRAPHY

Hiroyuki Yoneyama; Osamu Takahashi; Kazuaki Yoshida, and Takatoshi Ishikawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 3, 1989, Ser. No. 416,797

Claims priority, application Japan, Oct. 3, 1988, 63-249238

Int. Cl.[5] G03C *7/46, 7/407*

U.S. Cl. 430—377 **25 Claims**

1. A method for processing a silver halide color photosensitive material which comprises developing an image-wise exposed color photographic light-sensitive material comprising a support having thereon at least one light-sensitive silver halide emulsion layer containing a silver halide comprising at least 80 mol % silver chloride; at least one emulsion layer thereof comprising a dispersion of a mixture of (i) at least one oil-soluble non-diffusible cyan coupler capable of forming a substantially non-diffusible cyan dye by coupling with the oxidized form of a developing agent, and (ii) a water-insoluble polymer;

in a color developer solution comprising a primary amine color developing agent, and having a chloride ion concentration of from 3.5×10^{-2} to 1.5×10^{-1} mol/l, and a bromide ion concentration of from 3.0×10^{-5} to 1.0×10^{-3} mol/l.

5,004,676

PROCESS FOR THE PRODUCTION OF COLOR PHOTOGRAPHIC IMAGES COMPRISING REPLENISHING THE DEVELOPING SOLUTION

Heinz Meckl, Bergisch Gladbach; Sieghart Klötzer, Cologne; Erich Wolff, Solingen, and Helmut Häseler, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 323,064, Mar. 10, 1989, abandoned, which is a continuation of Ser. No. 188,171, Apr. 26, 1988, abandoned, which is a continuation of Ser. No. 766,539, Aug. 19, 1985, abandoned. This application Feb. 14, 1990, Ser. No. 481,737

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1984, 3431860

Int. Cl.[5] G03C *5/24, 7/00, 7/30*

U.S. Cl. 430—398 **3 Claims**

1. In a process for the production of color photographic images by development of an exposed silver halide recording material in a development bath of a predetermined volume containing a developing agent comprised of 4 to 40 mmol/l of at least one p-phenylenediamine derivative and/or its salt with an inorganic acid the improvement which comprises a silver halide recording material containing at least 90 mol-% of silver chloride, adding to said bath a replenisher containing 0.02 to 0.04 mol/l of said p-phenylenediamine derivative and water in

an amount to maintain and not exceed said predetermined volume of said development bath.

5,004,677

METHOD FOR PROCESSING A SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Shinji Ueda, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 21, 1989, Ser. No. 313,280
Claims priority, application Japan, Feb. 19, 1988, 63-36543
Int. Cl.[5] G03C 7/16
U.S. Cl. 430—382 23 Claims

1. A method for processing a silver halide color photographic material which comprises, after color development of an imagewise exposed silver halide color photographic material, processing the developed silver halide color photographic material by subjecting the developed silver halide color photographic material to a desilvering step, said desilvering step having a processing time of 1 to 4 minutes, said desilvering step including processing the developed silver halide color photographic material with a bleaching solution having a pH of from 5.3 to 2, wherein the silver halide color photographic material contains at least one DIR coupler having at its coupling active position a group which forms a development inhibitor or precursor thereof when released from the coupling active position of the coupler upon a coupling reaction with an oxidation product of an aromatic primary amine color developing agent which is formed upon a color development reaction, and further decomposes into a compound having substantially no effect on photographic properties once discharged into a color developing solution wherein the half-life period of the development inhibitor or precursor thereof at pH 10.0 is not more than 4 hours, and wherein the bleaching solution contains, as a bleaching agent, a ferric complex salt of 1,3-diaminopropanetetraacetic acid.

5,004,678

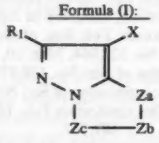
SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Nobuo Seto, and Masakazu Morigaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 5, 1989, Ser. No. 375,712
Claims priority, application Japan, Jul. 8, 1988, 63-170544
Int. Cl.[5] G03C 7/38
U.S. Cl. 430—548 20 Claims

1. A silver halide color photographic material comprising a support having thereon at least one silver halide emulsion layer, the silver halide color photographic material containing at least one pyrazoloazole type coupler represented by general formula (I) and at least one compound represented by general formula (II):

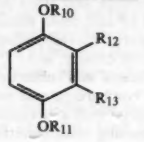
Formula (I):



(I)

wherein R_1 represents a hydrogen atom or a substituent; X represents a hydrogen atom or a group capable of being released upon a coupling reaction with an oxidation product of an aromatic primary amine developing agent; Za, Zb and Zc each represents a methine group, a substituted methine group, =N- or -NH-, one of the Za—Zb bond and the Zb—Zc bond being a double bond and the other being a single bond; when the Zb—Zc bond is carbon-carbon double bond, the Zb—Zc bond may be a part of a condensed aromatic ring; Rl or X may also form a polymer including a dimer or more; and when Za, Zb or Zc is a substituted methine group, the substituted methine group may form a polymer including a dimer or more;

Formula (II):



(II)

wherein R_{10} and R_{11}, which may be the same or different, each represents an aliphatic group or an aromatic group; R_{12} and R_{13}, which may be the same or different, each represents an aliphatic group, an aliphatic oxy group, an aromatic oxy group, an aliphatic thio group, an aromatic thio group, a nitrogen-containing heterocyclic group, an acylamino group, an aliphatic amino group or an aromatic amino group, or R_{12} and R_{13} may combine with each other to form a 5-membered or 6-membered hetero ring; and the aliphatic group or the aromatic group described above may be substituted.

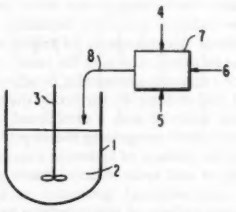
2. The silver halide color photographic material as claimed in claim 1, wherein the pyrazoloazole type coupler is a bis coupler or a polymer coupler containing a coupler moiety represented by general formula (I).

5,004,679

SILVER HALIDE PHOTOGRAPHIC MATERIAL AND PROCESS FOR THE PREPARATION THEREOF

Hiroyuki Mifune, and Shigeharu Urabe, both of Kanagawa, Japan, assignors to Fuji Photo Flim Co., Ltd., Kanagawa, Japan

Filed Jan. 9, 1990, Ser. No. 462,382
Claims priority, application Japan, Jan. 9, 1989, 1-2465
The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.
Int. Cl.[5] G03C 1/005
U.S. Cl. 430—567 14 Claims



1. A silver halide photographic material comprising at least one silver halide emulsion layer on a support, wherein light-sensitive silver halide grains in said at least one silver halide emulsion layer are obtained by charging previously prepared silver halide particles having a fine grain size into a reaction vessel which allows at least one of nucleation and crystallization of said light-sensitive silver halide grains so that at least one of nucleation and crystallization is effected in said reaction vessel, and said light-sensitive silver halide grains are subjected to chemical ripening in the presence of a silver halide solvent, wherein said silver halide particles having a fine grain size are formed by mixing an aqueous solution of a water-soluble silver salt and an aqueous solution of a water-soluble halide in a mixer provided outside said reaction vessel which allows at least one of nucleation and crystallization of light-sensitive silver halide grains, wherein an aqueous solution of protective colloid is charged into the mixer at a concentration of at least 2 wt % in at least one of the following ways:

(a) singly,

(b) in the aqueous solution of a water-soluble silver salt, and

(c) in the aqueous solution of a water-soluble halide.

5,004,680

HIGH-SPEED AND WELL-PRESERVABLE SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Toshihiko Yagi, Shiroyama; Kenji Kumashiro, Hachioji, and Hideki Takiguchi, Sagamihara, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jun. 1, 1989, Ser. No. 359,615
Claims priority, application Japan, Jun. 28, 1988, 63-161174
Int. Cl.[5] G03C *1/08, 1/34*
U.S. Cl. 430—603 17 Claims

1. A silver halide photographic light-sensitive material comprising a support having thereon a photographic component layer including at least one silver halide emulsion layer, in which said silver halide emulsion layer comprises silver halide grains, each of which is comprised of two or more phases different in the silver iodide content, wherein the average silver iodide content of said grain is higher than the silver iodide content of the external phase of said grain, and to at least one layer included said photographic component layer is added elementary sulfur in a step of the manufacturing process of said silver halide photographic light-sensitive material.

5,004,681

PRESERVATION OF FETAL AND NEONATAL HEMATOPOIETIC STEM AND PROGENITOR CELLS OF THE BLOOD

Edward A. Boyse, New York, N.Y.; Hal E. Broxmeyer, Indianapolis, Ind., and Gordon W. Douglas, New York, N.Y., assignors to Biocyte Corporation, New York, N.Y.

Filed Nov. 12, 1987, Ser. No. 119,746
Int. Cl.[5] A01N *1/02;* A61K *35/14*
U.S. Cl. 435—2 9 Claims

1. A composition comprising:
(a) a plurality of viable human neonatal or fetal hematopoietic stem cells derived from the blood; and
(b) cryopreservative.

5,004,682

METHOD AND KIT FOR DETECTING LIVE MICROORGANISMS IN CHLORINE- OR BROMINE-TREATED WATER

Katherine P. Roberts, Derby; Jon R. Geiger, West Hartford, and Jayne F. Carney, Wallingford, all of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Nov. 2, 1987, Ser. No. 115,313
Int. Cl.[5] C12Q *1/68, 1/02;* G01N *1/18;* C12N *1/06*
U.S. Cl. 435—6 14 Claims

1. A method for selectively detecting the presence of live microorganisms in a mixture of live and dead microorganisms in chlorine- or bromine-treated water, and avoiding false-positive detection of said dead microorganisms, which comprises:
(a) lysing live microorganisms present in a sample of chlorine- or bromine-treated water and rendering constituent nucleic acid molecules single-stranded to provide single-stranded target nucleic acid molecules;
(b) contacting said single-stranded target nucleic acid molecules with single-stranded labelled probe nucleic acid molecules containing a sequence complementary to nucleic acid molecules of an indicator microorganism selected from the group consisting of *Escherichia coli, Legionella pneumophila,* and *Campylobater jejuni* to form labelled hybridized probe/target nucleic acid molecules;
(c) separating said labelled hybridized probe/target nucleic acid molecules from said single-stranded nucleic acid molecules using separation means; and
(d) selectively detecting, by means of said label, nucleic acid molecules of said live microorganisms in said treated water.

5,004,683

MEANS FOR DETECTING AND ANALYZING NEUROANATOMY

Jonathan T. Erichsen, Stony Brook; Craig Evinger, Huntington, and Harvey J. Karten, Setauket, all of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Continuation of Ser. No. 892,191, Jul. 31, 1986, abandoned. This application Oct. 6, 1988, Ser. No. 254,447
Int. Cl.[5] G01N *33/53, 33/567, 33/577;* A61K *49/00*
U.S. Cl. 435—7.21 2 Claims

1. A process for tracing a neuroanatomical pathway in non-human animals comprising:
inserting or injecting atoxic fragment C of tetanus toxin in an amount sufficient to react with an antibody into a neuroanatomical pathway of an active neural circuit of said animal,
permitting said atoxic fragment to transport directly and/or transsynaptically through the neural circuit,
removing a section containing said neuroanatomical pathway from the animal,
preparing the section for immunoreaction with antibody,
immunohistochemically localizing said transported fragment C within the neural circuit with a monoclonal antibody produced by a hybridoma cell line said monoclonal antibody being specific for transported fragment C,
said localizing comprised of allowing said transported fragment C and said monoclonal antibody to form in vitro a detectable immunohistochemical reaction product at areas in the neural circuit to which fragment C has been transported so that the neuroanatomical pathway is thereby traced.

5,004,684

METHOD FOR ATP EXTRACTION

William J. Simpson, Salfords, and John R. M. Hammond, Oxted, both of England, assignors to Lumac BV, Landgraaf, Netherlands

Filed Sep. 19, 1988, Ser. No. 246,455
Claims priority, application United Kingdom, Sep. 22, 1987, 8722252
Int. Cl.[5] C12Q *1/66;* C12N *1/06*
U.S. Cl. 435—8 5 Claims

1. In a method for the assay of ATP from a microorganism which comprises contacting a sample containing said microorganism with an ATP releasing agent consisting essentially of an effective amount to release ATP of a cationic surface active agent, and thereafter determining the ATP released into the sample using a luciferin-luciferase reagent, the improvement which comprises eliminating the distorting effect of the releasing agent on the ATP assay, by addition of an amount of a non-ionic surface active agent to be effective as a neutralizing agent for the releasing agent after addition of said releasing agent and before said ATP assay.

5,004,685

DRY-TYPE MULTILAYER ANALYTICAL ELEMENT

Fuminori Arai, and Asaji Kondo, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 18, 1987, Ser. No. 86,514
Claims priority, application Japan, Aug. 19, 1986, 61-193705
Int. Cl.[5] C12Q *1/26*
U.S. Cl. 435—25 18 Claims

1. A dry multilayer analytical element for the determination of an analyte in an aqueous liquid sample by measuring the amount of hydrogen peroxide produced from the interaction of the analyte with an oxidase, comprising, in this order, a light-transmissive water-impermeable support, a chromogen-containing layer which produces an optically detectable change from the interaction of hydrogen peroxide, and a peroxidatively active substance-containing layer, said element further comprising an oxidase which reacts with the analyte to prou-

duce hydrogen peroxide, and a ferrocyanide, with the proviso that the ferrocyanide is in a layer separate from the chromogen-containing layer and is not interposed between the support and the chromogen-containing layer.

5,004,686

PROCESS FOR PRODUCING HUMAN EPIDERMAL GROWTH FACTOR AND ANALOGS THEREOF

Charles M. Cohen, Medway, and Roberto Crea, Boston, both of Mass., assignors to Creative Biomolecules, Inc., Hopkinton, Mass.

Division of Ser. No. 832,337, Feb. 24, 1986, Pat. No. 4,743,679. This application Jan. 4, 1988, Ser. No. 140,739

Claims priority, application Australia, Feb. 5, 1987, 69011/87; Canada, Feb. 5, 1987, 529101; European Pat. Off., Feb. 20, 1987, 87301490.6; Japan, Feb. 27, 1987, 62-41229

Int. Cl.[5] **C12N** *1/21, 9/52, 15/12, 15/63, 15/70;* **C12P** *21/06*

U.S. Cl. 435—69.1 **9 Claims**

1. A method for producing an epidermal growth factor or a biologically active analog of an epidermal growth factor comprising the steps of:

A. constructing a vector including a DNA sequence encoding a fused polypeptide having the formula:

X—Glu—EGF

wherein X is a leader sequence oligopeptide which serves to promote expression of said fused polypeptide in said host cell, Glu is a linking glutamyl residue, and EGF is the amino acid sequence of an epidermal growth factor or an active analog thereof, said EGF being attached at its N-terminal end to said linking Glu residue, and said linking Glu residue being attached to the C-terminal end of said leader sequence oligopeptide;

B. transfecting a microbial host cell with said vector;

C. expressing said DNA sequence in said host cell to produce a fused polypeptide;

D. isolating said fused polypeptide from said host cell; and

E. treating said fused polypeptide with *Staphylococcus aureus* V8 protease under conditions and for a time suitable to preferentially cleave said fused polypeptide at said linking glutamyl residue to release said EGF.

5,004,687

INSECT VIRUS VECTOR WITH BROADENED HOST RANGE

Lois K. Miller, Moscow, Id., assignor to University of Georgia Research Foundation, Inc., Athens, Ga.

Filed May 21, 1985, Ser. No. 736,478

Int. Cl.[5] **C12N** *15/86, 15/00, 7/01*

U.S. Cl. 435—69.1 **8 Claims**

5. A method for producing an exogenous gene product in insect cells which method comprises culturing insect cells which are incapable of permitting replication of an unmodified baculovirus which cells have been infected or transfected with a recombinant baculoviral expression vector which comprises a gene coding for the exogenous gene product wherein transcription of said gene is controlled by a promoter of an LTR selected from the group consisting of retroviral LTRs and transposable element LTRs.

5,004,688

PURIFICATION OF HEPATITIS PROTEINS

William S. Craig, and Robert S. Siegel, both of San Diego, Calif., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 15, 1988, Ser. No. 181,934

Int. Cl.[5] **C12P** *21/06;* **C12N** *15/00;* **C07K** *13/00*

U.S. Cl. 435—69.3 **8 Claims**

1. A process for recovering hepatitis B surface antigen from *Pichia pastoris* cells comprising:

(a) lysing said yeast cells in the presence of a buffered chaotropic salt, wherein said chaotropic salt is selected from the group consisting of sodium thiocyanate, potassium thiocyanate, sodium iodide, potassium iodide, sodium hypochlorite, lithium chloride, lithium bromide, guanidiniium hydrochloride, guanidinium thiocyanate, and urea, wherein said chaotropic salt is present in the concentration of from about 1 molar to about 8 molar, and wherein said chaotropic salt is buffered by a buffer system having a pH within the range of about 6 to about 8;

(b) subjecting the hepatitis B surface antigen-containing supernatant obtained in step (a) to conditions suitable to precipitate lipids and contaminant proteins from said supernatant wherein said precipitation of lipids and contaminant proteins is accomplished by heating said hepatitis B surface antigen-containing supernatant to a temperature range of about 45° to about 55° C. for a period of time ranging from about 10 to about 30 minutes;

(c) subjecting the hepatitis B surface antigen-containing supernatant obtained in step (b) to diafiltration wherein said diafiltration is conducted with a membrane having a molecular weight exclusion limit within the range of about 5,000 to about 500,000;

(d) contacting the hepatitis B surface antigen-containing retentate obtained in step (c) with silica wherein said silica has an accessible surface area with the range of 100 m^2/gm to 500 m^2/gm and wherein, when the initial particle concentration is $\geq 1\%$ of the total extractable protein from the lysed cell extract, then for every 1 mg of hepatitis B surface antigen activity present in said hepatitis B surface antigen-containing supernatant, there is utilized 50–100 mg of silica, and wherein, when the initial particle concentration is $<1\%$ of the total extractable protein from the lysed cell extract, then for every 1 mg of hepatitis B surface antigen activity present in said hepatitis B surface antigen-containing supernatant, there is utilized a corresponding proportional increase in silica from a base of 50–100 mg of silica per 1%;

(e) washing contaminant proteins from the resulting silica-adsorbed hepatitis B surface antigen with a buffer having a pH within the range of about 6 to about 8;

(f) eluting the hepatitis B surface antigen from the silica with a buffered eluant having a pH within the range of about 9.5 to about 11.0 containing from 0.5 to 8 molarity of urea;

(g) subjecting the hepatitis B surface antigen-containing fraction obtained in step (f) to gel filtration step suitable to separate said hepatitis B surface antigen from contaminant proteins, rein said hepatitis B surface antigen-containing fraction is subjected to gel filtration on a polar matrix selected from the group consisting of agarose gels, dextran gels, and polyacrylamide gels, and wherein said polar matrix has a molecular weight exclusion of at least 1 million and said hepatitis B surface antigen is eluted through said polar matrix with a buffer having a pH within range of about 6 to about 9; and

(h) subjecting the hepatitis B surface antigen containing fraction obtained in step (g) to an anion exchange chromatography step suitable to separate said hepatitis B surface antigen from contaminant proteins wherein said ion exchange chromatography is conducted with an anion-exchange resin utilizing a diethyl aminoethyl cation and wherein said hepatitis B surface antigen is eluted from said anion exchange resin by utilizing a buffer having a pH within the range of about 6 to about 9 and an electrolyte concentration ranging from 0 molarity to 0.3 molarity.

5,004,689

DNA SEQUENCES, RECOMBINANT DNA MOLECULES AND PROCESSES FOR PRODUCING HUMAN GAMMA INTERFERON-LIKE POLYPEPTIDES IN HIGH YIELDS

Walter C. Fiers, Destelbergen, Belgium, and Bernard Allet, Onex, Switzerland, assignors to Biogen, Massachusetts, Cambridge, Mass.

Continuation-in-part of Ser. No. 920,720, Oct. 17, 1986, abandoned, which is a continuation of Ser. No. 722,743, Apr. 12, 1985, abandoned, which is a continuation of Ser. No. 467,466, Feb. 17, 1983, abandoned, which is a continuation-in-part of Ser. No. 800,069, Nov. 14, 1985. This application Mar. 27, 1987, Ser. No. 31,042

Claims priority, application United Kingdom, Feb. 22, 1982, 8205203; Mar. 16, 1984, 8406910; May 24, 1984, 8413297

Int. Cl.[5] C12P *21/00;* C12N *1/20, 15/00*

U.S. Cl. 435—69.51 12 Claims

1. An expression vector for producing IFN-γ type polypeptides in hosts transformed with it comprising a DNA sequence encoding a polypeptide of the IFN-γ type, said DNA sequence being operatively linked to an expression control sequence comprising the promoter-operator regions and Shine-Dalgarno sequence of a trp operon and further comprising the DNA sequence ATCGATACT between the Shine-Dalgarno sequence and the translational start sequence of the DNA sequence encoding a polypeptide of the IFN-γ type.

5,004,690

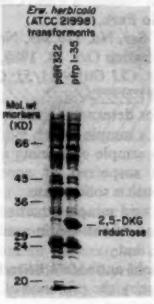
ASCORBIC ACID INTERMEDIATES AND PROCESS ENZYMES

David R. Light, San Francisco, and William H. Rastetter, San Mateo, both of Calif., assignors to Genetech, Inc., San Francisco, Calif.

Continuation of Ser. No. 135,888, Dec. 21, 1987, which is a division of Ser. No. 620,652, Jun. 14, 1984, Pat. No. 4,758,514, which is a continuation-in-part of Ser. No. 508,409, Jun. 28, 1983, abandoned. This application Jul. 17, 1989, Ser. No. 380,788

Int. Cl.[5] C12P *7/60;* C12N *15/00*

U.S. Cl. 435—138 1 Claim



1. A method of using a DNA sequence encoding 2,5-diketogluconic acid (2,5-DKG) reductase for effecting the conversion of 2,5-DKG into 2-keto-L-gulonic acid (2-KLG) which comprises expressing said DNA sequence in host cells transformed with an expression vehicle containing said DNA sequence and contacting a mixture comprising 2,5-DKG with 2,5-DKG reductase produced by said expression.

5,004,691

METHOD FOR PRODUCING THE ACCI RESTRICTION ENDONUCLEASE AND METHYLASE

Shu-zi Chen, Cambridge, and Geoffrey G. Wilson, Boxford, both of Mass., assignors to New England Biolabs, Inc., Beverly, Mass.

Filed Dec. 17, 1987, Ser. No. 133,957

Int. Cl.[5] C12N *15/52, 9/22, 1/21*

U.S. Cl. 435—172.3 9 Claims

1. Isolated DNA coding for the AccI restriction endonuclease, wherein the isolated DNA is obtainable from the vector pSC161RMO/P17.

5,004,692

CLONING AND EXPRESSION OF PHOSOPHOLIPASE C GENES

J. Yun Tso, Menlo Park, and Cary L. Queen, Palo Alto, both of Calif., assignors to Protein Design Labs, Inc., Mountain View, Calif.

Filed Dec. 15, 1987, Ser. No. 132,387

Int. Cl.[5] C12N *9/00, 9/14*

U.S. Cl. 435—183 18 Claims

10. A process for producing a Clostridium Phospholipase C polypeptide comprising the steps of:

(a) forming a vector comprising a nucleotide sequence coding for said polypeptide, said sequence operably linked to an expression control sequence;

(b) transforming or transfecting a host cell with the vector; and

(c) maintaining the host cell under conditions suitable for expression of the nucleotide sequence.

5,004,693

PSEUDORABIES VIRUS RECOMBINANTS AND THEIR USE IN THE PRODUCTION OF PROTEINS

Lynn W. Enquist, Greenville; Alan K. Robbins, and Mary E. Whealy, both of Wilmington, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 886,691, Jul. 18, 1986. This application Oct. 20, 1989, Ser. No. 424,784

Int. Cl.[5] C12P *21/00;* C12N *15/00, 7/00*

U.S. Cl. 435—235.1 3 Claims

1. A recombinant pseudorabies virus comprising an EcoRI site inserted into the viral genome.

5,004,694

COMPLEMENT-DEPENDENT CYTOLYTIC ANTI-*TRICHOMONAS VAGINALIS* MONOCLONAL ANTIBODIES

Neomi Moav, Tel Aviv, and Enrica Draghi, Rehovot, both of Israel, assignors to Interpharm Laboratories Ltd., Ness-Ziona, Israel

Filed Sep. 4, 1987, Ser. No. 93,431

Claims priority, application Israel, Sep. 5, 1986, 79950

Int. Cl.[5] C12N *5/00;* A61K *39/00*

U.S. Cl. 435—240.27 13 Claims

1. An anti-*Trichomonas vaginalis* monoclonal antibody of the subclass IgG_3 which:

(a) fixes complement;

(b) lyses *Trichomonas vaginalis* in the presence of exogenous complement; and,

(c) agglutinates but does not lyse *Trichomonas vaginalis* in the absence of exogenous complement.

5,004,695

MICROBIOLOGICAL PROCESS FOR PREPARING 9α-HYDROXY-4-ANDROSTENE-3,17-DIONE

Antonia Jekkel nee Bokany; Karoly Albrecht; Gabor Ambrus; Tibor Lang; Istvan M. Szabo; Éva Ilköy; Kalman Könczöl; Imre Moravcsik; Gabor Hantos; Emilia Simonovits; Zsuzsanna Lengyel nee Szemenyei; Zsuzesanna Vida, all of Budapest, and Éva Csajagi, Pécs, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar R.T., Budapest, Hungary

Filed Nov. 5, 1987, Ser. No. 116,872

Claims priority, application Hungary, Nov. 18, 1986, 4757/86

Int. Cl.[5] C12N *1/20;* C12P *33/16, 33/18*

U.S. Cl. 435—253.1 2 Claims

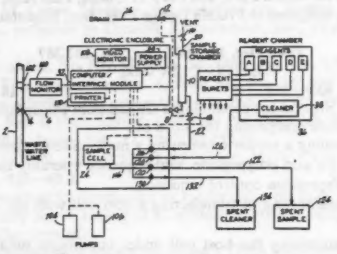
1. A strain of the genus Mycobacterium having all of the identifying characteristics of *Mycobacterium roseum* NCAIM B (P) 000339.

5,004,696

AUTOMATIC TOTAL REDUCERS MONITORING AND ADJUSTMENT SYSTEM

Jack L. Clinkenbeard, Anaheim, Calif., assignor to Ashland Oil, Inc., Russell, Ky.

Filed Mar. 24, 1988, Ser. No. 172,682
Int. Cl.[5] C01N *21/00, 31/00*
U.S. Cl. 436—51 10 Claims



1. A process for monitoring or adjusting, or concentration of total reducer constituents in an aqueous medium, comprising the steps of:

(1) adding a predetermined aliquot of said total reducers-containing water to a sample cell, said sample cell equipped with means for transmitting light of variable intensity through the filled sample cell and means for sensing the presence or absence of said light transmission after passing through said filled sample cell;

(2) adding to said aliquot-filled sample cell predetermined amounts of a pH 5.0–5.5 buffer reagent, an optional methyl red indicator, an optional hydrochloric acid solution and a starch indicator;

(3) activating said light transmission means in said sample cell in order to send light of a sufficient intensity through said filled sample cell to be sensed by said light sensing means;

(4) then titrating an iodine solution into said filled sample cell at a predetermined rate of addition while sensing the presence or absence of said light transmission in said cell;

(5) measuring the time taken from the start of the iodine titration until the absence of said light sensing through said filled cell is detected;

(6) translating this time measurement into either the concentration of total reducer constituents in said water medium or into the amount of an oxidant chemical to be fed into said water medium, or both; and

(7) based on said translation, sending either a first output signal to at least one monitoring means or a second output signal to at least one process adjustment means location whereby said concentration of total reducer constituents in said water medium is adjusted, or sending both first and second signals.

5,004,697

CATIONIZED ANTIBODIES FOR DELIVERY THROUGH THE BLOOD-BRAIN BARRIER

William M. Pardridge, Pacific Palisades, Calif., assignor to Univ. of CA, Calif. and Alkermes, Pa.

Filed Aug. 17, 1987, Ser. No. 85,627
Int. Cl.[5] A61K *39/00*
U.S. Cl. 436—547 9 Claims

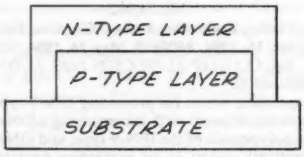
1. In a diagnostic composition comprising one or more antibodies for administration to an individual for neurodiagnostic purposes, said antibodies having a relatively low transfer rate across the blood-brain barrier, wherein the improvement comprises cationizing said antibodies to provide cationized antibodies having an isoelectric point of between about 8.0 and 11.0, said cationized antibodies having increased rates of transfer across said blood-brain barrier.

5,004,698

METHOD OF MAKING PHOTODETECTOR WITH P LAYER COVERED BY N LAYER

Paul R. Norton, Santa Barbara; Michael Moroz, and Carol S. Talley, both of Goleta, all of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Division of Ser. No. 804,711, Dec. 5, 1985, Pat. No. 4,914,495.
This application Jan. 16, 1990, Ser. No. 464,840
Int. Cl.[5] H01L *31/18*
U.S. Cl. 437—3 27 Claims



1. A method for making a photodetector comprising epitaxially growing a body of semiconductor material on an electrically insulating substrate; subdividing said body into a plurality of photodetectors; annealing the resulting plurality of semiconductor bodies attached to said substrate for a time sufficient to form a region of first conductivity type substantially completely overlying the top and sides of a region of second conductivity type of each of said bodies, and said photodetector having a detectivity of at least about 2×10^{17} $\lambda(\eta/Q_B)^{\frac{1}{2}}$cmHz$^{\frac{1}{2}}$/Watt where the radiation incident on said photodetector is in the range of about 1 to about 25 microns or more, and where λ is the wavelength of radiation incident on said photodetector, Q_B is the background photon flux, and η is the quantum efficiency.

5,004,699

METHOD TO DETECT FUNGI AND YEASTS

Mark A. Winters, Mountain View, Calif., assignor to SRI International, Menlo Park, Calif.

Continuation of Ser. No. 123,389, Nov. 20, 1987, abandoned.
This application Oct. 24, 1989, Ser. No. 426,538
Int. Cl.[5] G01N *33/53;* C12Q *1/04*
U.S. Cl. 435—7.31 19 Claims

1. A method for determining the presence of chitin-containing organisms in a sample which method comprises:

(a) attaching a sample containing a fluid and nonfluid component and suspected of containing chitin-containing organisms onto a solid phase;

(b) contacting said sample attached on the solid phase with a composition of anti-chitin antibodies which selectively binds chitin; and

(c) detecting said antibodies bound to chitin present in the sample whereby the presence of chitin-containing organisms is determined.

5,004,700

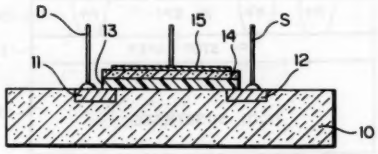
HUMIDITY SENSOR

Brian C. Webb, Sunbury-on-Thames; Derek G. Pedley, Amersham; Stephen J. Prosser, Thame, all of United Kingdom; Masaya Hijikigawa, and Hisatoshi Furubayashi, both of Yamatokoriyama, Japan, assignors to EMI Limited, Hayes, United Kingdom and Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 237,693, Aug. 26, 1988, abandoned, which is a continuation of Ser. No. 641,693, Aug. 17, 1984, abandoned.
This application Aug. 1, 1990, Ser. No. 561,377
Claims priority, application United Kingdom, Aug. 19, 1983, 8322418
Int. Cl.[5] H01L *21/288;* G01N *27/12*
U.S. Cl. 437—42 13 Claims

1. A method of fabricating a humidity sensor comprising the steps of:

providing a host device constituting a semi-conductor substrate and the gate insulator of an insulated gate field effect transistor, the gate insulator having an exposed surface;



forming a layer of an aqueous solution of polyvinyl alcohol on the exposed surface of the gate insulator;

subjecting said layer to heat treatment to cause crystallization and/or stabilization of the polyvinyl alcohol; and

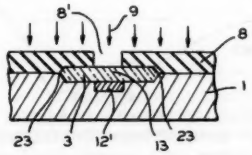
forming a gate electrode on said layer so treated.

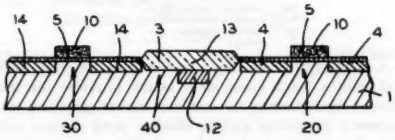
5,004,701

METHOD OF FORMING ISOLATION REGION IN INTEGRATED CIRCUIT SEMICONDUCTOR DEVICE

Kazumasu Motokawa, Yamaguchi, Japan, assignor to NEC Corporation, Japan

Filed Jan. 27, 1989, Ser. No. 303,721
Claims priority, application Japan, Jan. 29, 1988, 63-19984
Int. Cl.[5] H01L *21/76*
U.S. Cl. 437—47 **7 Claims**





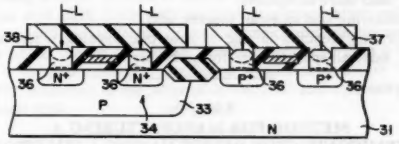
1. A method of manufacturing an isolation region in an integrated circuit semiconductor device comprising the steps of forming a first mask pattern made of anti-oxidant material on a surface of a semiconductor substrate of one conductivity type, forming selectively a field oxide layer by a heat treatment under an oxidizing atmosphere on a field region of said substrate between first and second circuit element forming regions of said substrate by using said first mask pattern as a mask, forming a second mask pattern on said substrate including said field oxide layer, thereafter, introducing ions of impurity of said one conductivity type by ion-implantation into a portion of said substrate under a part of said field oxide layer through said field oxide layer by using said second mask pattern as a mask, carrying out a first lamp annealing during a first time period for an activation of said implanted impurities of said one conductivity type to form a channel stopper region of said one conductivity type having a higher impurity concentration than said substrate in said portion of said substrate abutted against the bottom of said part of said field oxide layer wherein said portion of said substrate forming said channel stopper region is separated from said first circuit element forming region by a first distance and from said second circuit element forming region by a second distance which is substantially the same value as said first distance.

5,004,702

PREPARATION METHOD OF SELECTIVE GROWTH SILICON LAYER DOPED WITH IMPURITIES

Shuichi Samata, and Yoshiaki Matsushita, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 17, 1989, Ser. No. 338,794
Claims priority, application Japan, Oct. 19, 1987, 62-263128
Int. Cl.[5] H01L *21/225*
U.S. Cl. 437—57 **7 Claims**



3. A method of manufacturing a semiconductor device in a single reactive furnace chamber comprising the steps of:

providing a semiconductor substrate having a region of the first conductivity type and a region of the second conductivity type;

forming an insulating film on said semiconductor substrate;

forming a first opening and a second opening in said insulating film, said first opening being connected to said region of the first conductivity type, and said second opening being connected to said region of the second conductivity type;

placing said substrate in the reactive furnace chamber;

selectively growing a first semiconductor layer in said first opening and a second semiconductor layer in said second opening;

removing said substrate from the reactive furnace chamber; and

forming a first diffusion source layer containing impurities of the first conductivity type on said first semiconductor layer, and a second diffusion source layer containing impurities of the second conductivity type on said second semiconductor layer;

diffusing impurities to said first semiconductor layer from said first diffusion source layer, and diffusing impurities to said second semiconductor layer from said second diffusion source layer; and

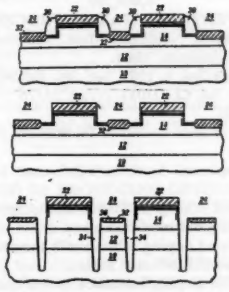
removing said first diffusion source layer and said second diffusion source layer.

5,004,703

MULTIPLE TRENCH SEMICONDUCTOR STRUCTURE METHOD

Peter J. Zdebel, Mesa, and Barbara Vasquez, Chandler, both of Ariz., assignors to Motorola, Schaumburg, Ill.

Filed Jul. 21, 1989, Ser. No. 382,947
Int. Cl.[5] H01L *21/76*
U.S. Cl. 437—67 **14 Claims**



1. A method of forming a multiple trench semiconductor structure comprising the steps of:

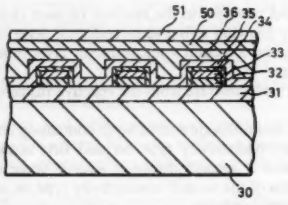
providing a semiconductor substrate;
forming a blanket buried layer in said semiconductor substrate;
forming a dielectric layer on said semiconductor substrate;
forming at least one opening in said dielectric layer; and in the following order:
forming an oxide layer on the bottom and sidewalls of said at least one opening;
forming sidewall spacers in said at least one opening;
forming a dielectric lens in said at least one opening between said sidewall spacers;
removing said sidewall spacers; and
forming trenches in said at least one opening where said sidewall spacers were formerly disposed.

5,004,704

METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE HAVING A PHOSPHO SILICATE GLASS LAYER AS AN INTERLAYER INSULATING LAYER

Satoshi Maeda, Ooita, and Shizuo Sawada, Kanagawa, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Oct. 30, 1989, Ser. No. 428,903
Claims priority, application Japan, Nov. 28, 1988, 63-298223
Int. Cl.[5] H01L *21/441*
U.S. Cl. 437—195 **12 Claims**



1. A method for forming a multilevel interconnection structure on a substrate having a main surface, comprising the steps of:
forming a first wiring layer on the main surface of the substrate;
forming an oxide layer on the first wiring layer;
forming a first Boron-doped Phospho Silicate Glass (BPSG) layer on the oxide layer;
heating the substrate in steam;
forming a second Boron-doped Phospho Silicate Glass layer on the first BPSG layer;
heating the substrate in steam; and
forming a second wiring layer on the second BPSG layer.

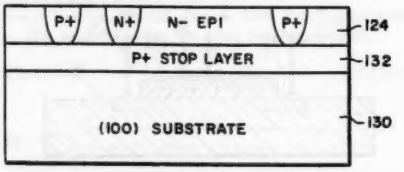
5,004,705

INVERTED EPITAXIAL PROCESS

Scott C. Blackstone, Needham, Mass., assignor to Unitrode Corporation, Lexington, Mass.

Filed Jan. 6, 1989, Ser. No. 295,045
Int. Cl.[5] H01L *21/20, 21/76*
U.S. Cl. 437—225 **69 Claims**

6. A method of semiconductor fabrication, comprising the steps of:
growing an epitaxial layer on a substrate to form a first wafer;
diffusing a first doping substance in the epitaxial layer to provide a first diffusion region;
diffusing a second doping substance in the epitaxial layer to provide a second diffusion region;
diffusing a third doping substance in the epitaxial layer to provide a third diffusion region, said third doping substance being of the same plurality as said second doping substance, and said second diffusion region being in electrical contact with said third diffusion region;
bonding the surface of said first wafer having the epitaxial layer and the diffusions to a second wafer; and



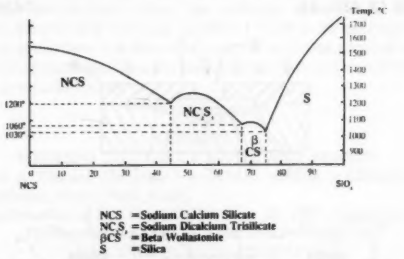
removing at least a portion the substrate of said first wafer, revealing said first and second diffusion regions.

5,004,706

PRODUCING MOLTEN GLASS AND BATCH COMPONENTS THEREFOR

Clive F. Dickinson, Lancashire, England, assignor to Pilkington plc, Merseyside, England

Filed Dec. 7, 1988, Ser. No. 280,815
Claims priority, application United Kingdom, Dec. 10, 1987, 8728892
Int. Cl.[5] C03C *6/00*
U.S. Cl. 501—27 **19 Claims**



1. A method of producing a molten glass wherein silica is heated with a batch component which provides the major portion of the sodium in the resultant molten glass and which comprises a crystalline sodium alkaline earth silicate, which has Na_2O, alkaline earth oxide, and SiO_2 components in a molar ratio of 1:1:1.

5,004,707

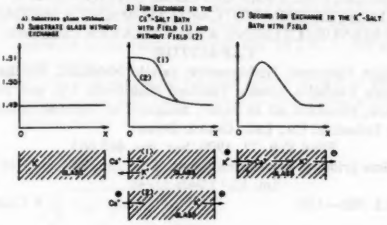
LIGHTWAVE GUIDE PRODUCED FROM SPECIAL SUBSTRATE GLASSES BY ION EXCHANGE AGAINST CS^+ IONS

Ludwig Ross, Klein-Winternheim, and Werener Schumann, Mainz, both of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Continuation of Ser. No. 267,651, Nov. 1, 1988, abandoned, which is a continuation of Ser. No. 821,435, Jan. 22, 1986, abandoned. This application Nov. 16, 1989, Ser. No. 437,295
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1985, 3501898; Jul. 10, 1985, 3524605
Int. Cl.[5] C03C *13/04*
U.S. Cl. 501—37 **16 Claims**

1. Lightwave guide, characterized in that it is produced from a substrate glass consisting essentially of the following composition, in mol %:

SiO_2	45–72
B_2O_3	8–25
Al_2O_3	1–25



Li_2O	0–1
Na_2O	0–2
K_2O	6–18
MO	0–1

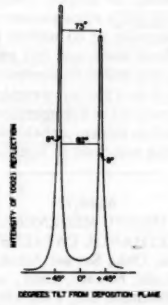
(MO-MgO, CaO, SrO, BaO, ZnO, PbO), in which a portion of the O^{2-} ions present in the glass is replaced by 1–15 mol % F^- ions to facilitate diffusion of Cs^+ ions therein, and in which a lightwave conductive zone has been produced by incorporating Cs^+ ions into the substrate glass by an ion-exchange of K^+, Li^+ and/or Na^+ ions against Cs^+ ions to effect a refractive index gradient within the glass.

5,004,708

PYROLYTIC BORON NITRIDE WITH COLUMNAR CRYSTALLINE MORPHOLOGY

Arthur W. Moore, North Olmstead, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 2, 1989, Ser. No. 318,349
Int. Cl.[5] C04B *35/58*
U.S. Cl. 501—96 **19 Claims**



1. A pyrolytic boron-nitride composition comprising boron nitride and a trace amount of zirconium, the composition having a bimodal X-ray rocking curve for the 002 plane with a peak X-ray intensity between −35° and −37° and a peak X-ray intensity between +35° and +37° from the angle corresponding to deposition plane, each of the two peak intensities having a FWHM less than 30°, wherein the rocking curve has an X-ray intensity at the zero degree angle corresponding to the deposition plane of less than about 20 percent of either of the two peak intensities.

5,004,709

HIGH SURFACE AREA SILICON NITRIDE AND USE THEREOF

Gerald T. Stranford, Palatine; Stephen T. Gonczy, Mt. Prospect, and Roy T. Mitsche, Wauconda, all of Ill., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Mar. 16, 1989, Ser. No. 324,132
Int. Cl.[5] C04B *35/56, 35/58*
U.S. Cl. 501—97 **32 Claims**

1. A ceramic article formed by reacting a shaped mixture comprising a major portion of silicon and a minor portion of iron and rare earth oxide with nitrogen at a temperature and for a time sufficient to form a crystalline and continuous silicon nitride phase, the article having a surface area of at least 3.5 m^2/g, a thermal expansion coefficient smaller than 6×10^{-6} m/m/°C. measured in the range of 20°–800° C. and a porosity of at least 30%.

5,004,710

METHOD FOR THE CHEMICAL PREPARATION OF ZIRCONIA ALLOY POWDERS AND ARTICLE

Michael P. Anderson, Gillette, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jun. 8, 1987, Ser. No. 59,504
Int. Cl.[5] C04B *35/48*
U.S. Cl. 501—103 **19 Claims**

1. A method for producing a metallic oxide ceramic article having good fracture toughness, said method comprising forming a solution of a metal compound whose oxide is present in said metal oxide ceramic article, precipitating said metal from said solution in the form of a hydrophilic colloid of a hydroxide of said metal, forming spherical particles by spray atomization of a slurry of said colloid into a cryogenic liquid, calcining said particles to convert said metal hydroxide to a ceramic oxide and compacting and sintering said calcined particles to form a ceramic article having good fracture toughness.

5,004,711

PROCESS OF PRODUCING COLLOIDAL ZIRCONIA SOLS AND POWDERS USING AN ION EXCHANGE RESIN

Raymond J. Grodek, Seven Hills, Ohio, assignor to Harshaw/-Filtrol Partnership, Cleveland, Ohio

Continuation of Ser. No. 130,800, Dec. 9, 1987, abandoned. This application Oct. 13, 1989, Ser. No. 423,525
Int. Cl.[5] C01G *25/02*; C04B *35/48*
U.S. Cl. 501—103 **19 Claims**

13. A method of preparing spherical colloidal size zirconium oxide particles comprising

(A) preparing a liquid mixture comprising at least one zirconium salt and a compatible liquid vehicle;

(B) contacting said liquid mixture with an anionexchange resin for a period of time sufficient to form a hydrous zirconium oxide sol having a pH of at least about 5.0;

(C) recovering the hydrous zirconium oxide sol from the resin; and

(D) drying the hydrous zirconium oxide sol of (C) and thereafter calcining the dried sol at a temperature of from about 550° C. to about 1100° C. to form the spherical colloidal size zirconium oxide particles wherein the zirconium oxide particles are substantially uniform particles with diameters in the range from 0.01 micron to 2.0 microns.

5,004,712

METHOD OF PRODUCING OPTICALLY TRANSPARENT YTTRIUM OXIDE

Brian P. Borglum, North Andover, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Nov. 25, 1988, Ser. No. 276,975
Int. Cl.[5] C04B *35/50*; B29D *11/00*
U.S. Cl. 501—126 **19 Claims**

1. A method of densifying a body having a substantially

closed porosity density, consisting essentially of yttrium oxide, to substantially full density, comprising the step of:

heating said closed porosity body to an elevated temperature at an elevated isostatic pressure until said body is substantially fully dense while said body is disposed adjacent an oxygen supplying ceramic media which provides an oxygen partial pressure to maintain O_2 stoichiometry in said body.

5,004,713

FREQUENCY STABLE NPO CERAMICS

Pronob Bardhan, Corning, and Chyang J. Yu, Painted Post, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Jul. 5, 1989, Ser. No. 375,701
Int. Cl.[5] C04B *35/46*
U.S. Cl. 501—134 **13 Claims**

1. Bismuth-containing, temperature-stable dielectric ceramics that are stable over a wide range of frequency which are defined by the formula

$$Bi_2O_3\ xTiO_2$$

wherein x ranges between 4 and 5 and at least part of the Ti^{4+} ion is replaced with a single pair of mixed ions selected from the group consisting of

(1) $A_{\frac{1}{2}}^{2+}B_{\frac{1}{2}}^{5+}$,
(2) $R_{\frac{1}{2}}^{3+}C_{\frac{1}{2}}^{6+}$,
(3) $A_{\frac{1}{2}}^{2+}C_{\frac{1}{2}}^{6+}$,
(4) $R_{\frac{1}{2}}^{3+}B_{\frac{1}{2}}^{5+}$,
(5) $M_{\frac{1}{2}}^{1+}B_{\frac{1}{2}}^{5+}$, and
(6) $M_{2/5}^{1+}C_{3/5}^{6+}$,

wherein:

M^{+} is selected from the group consisting of Li^{+}, Na^{+}, K^{+}, Cu^{+}, and Ag^{+};

A^{2+} is selected from the group consisting of Mg^{2+}, Zn^{2+}, Ni^{2+}, Co^{2+}, Cu^{2+}, and Cd^{2+};

R^{3+} is selected from the group consisting of Cr^{3+}, Mn^{3+}, Fe^{3+}, Al^{3+}, Ga^{3+}, Zn^{3+}, Tl^{3+}, Sb^{3+}, As^{3+}, Y^{3+}, Lu^{3+}, Yb^{3+}, Tm^{3+}, Er^{3+}, Ho^{3+}, Dy^{3+}, Tb^{3+}, Gd^{3+}, Eu^{3+}, and Sm^{3+};

B^{5+} is selected from the group consisting of Nb^{5+}, Ta^{5+}, and V^{5+}; and

C^{6+} is selected from the group consisting of W^{6+} and Mo^{6+}.

5,004,714

METHOD OF MODIFYING CERAMIC COMPOSITE BODIES BY A POST-TREATMENT PROCESS AND ARTICLES PRODUCED THEREBY

Terry D. Claar; William B. Johnson, both of Newark, Del., and Robert A. Rapp, Columbus, Ohio, assignors to Lanxide Technology Company, LP, Newark, Del.

Filed Jan. 13, 1989, Ser. No. 296,966
Int. Cl.[5] C04B *35/10*
U.S. Cl. 501—134 **5 Claims**

1. A method of producing a self-supporting ceramic composite body comprising producing a first composite body by:

selecting a parent metal;

heating said parent metal in a substantially inert atmosphere to a temperature sufficient to permit infiltration of molten parent metal into a mass comprising boron carbide and reacting molten parent metal with said boron carbide to form at least one boron-containing compound;

continuing said infiltration reaction for a time sufficient to produce said first composite body comprising at least one parent metal boron-containing compound; and

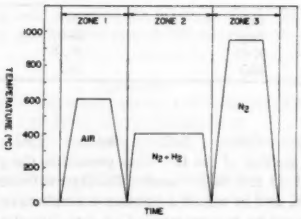
contacting said first composite body with a source of a second metal, thereby reacting at least a portion of said first composite body with said second metal to modify at least one property of the first composite body in at least a portion thereof, thereby producing said self-supporting body.

5,004,715

DIELECTRIC CERAMIC COMPOSITION AND A MULTILAYER CERAMIC CAPACITOR AND A METHOD OF MANUFACTURING A MULTILAYER CERAMIC CAPACITOR

Yasuhiko Hakotani, Nishinomiya; Seiichi Nakatani, Hirakata; Satoru Yuuhaku, Osaka; Tsutomu Nishimura, Uji, and Toru Ishida, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 22, 1990, Ser. No. 483,462
Claims priority, application Japan, Feb. 23, 1989, 1-43701
Int. Cl.[5] C04B *35/46*
U.S. Cl. 501—136 **6 Claims**



1. A ceramic composition comprising lead magnesium niobate ($Pb(Mg_{\frac{1}{3}}Nb_{\frac{2}{3}})O_3$) in an amount of 75.0 to 97.0 mol % and copper oxide in an amount of 3.0 to 25.0 mol % in terms of cupric oxide (CuO).

5,004,716

SYNTHETIC STEVENSITE AND PROCESS FOR PREPARATION THEREOF

Masahide Ogawa; Teiji Sato; Masanori Tanaka, and Noriyuki Takahashi, all of Niigata, Japan, assignors to Mizusawa International Chemicals, Ltd., Tokyo, Japan

Division of Ser. No. 150,613, Feb. 1, 1988. This application Apr. 2, 1990, Ser. No. 503,300
Claims priority, application Japan, Feb. 2, 1987, 62-20476
Int. Cl.[5] C04B *33/00*
U.S. Cl. 501—141 **4 Claims**

1. A process for producing synthetic stevensite, which comprises hydrothermally treating a fluorine-ion-free aqueous composition containing as metallic components only basic magnesium carbonate and a silica-sodium component selected from the group consisting of (i) sodium silicate, (ii) sodium silicate and amorphous silica, and (iii) amorphous silica and sodium hydroxide, the solids concentration of the aqueous composition being 5 to 15% by weight, the hydrothermal treatment being carried out at a temperature of 100° to 300° C. under a pressure of 0 to 100 kg/cm^2-G, and the resulting synthetic stevensite being non-toxic to humans.

5,004,717

PROCESS FOR IN-SITU REGENERATION OF AGED METHANOL CATALYSTS

Sunggyu Lee, Akron, Ohio; Sawant Ashok, New Delhi, India, and Conrad J. Kulik, Newark, Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

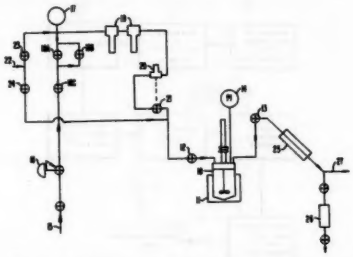
Filed Apr. 28, 1989, Ser. No. 345,140
Int. Cl.[5] B01J *23/94, 38/18;* C07C *29/16*
U.S. Cl. 502—50 **11 Claims**

1. A process for regenerating an aged alcohol synthesis catalyst comprising coprecipitated copper-containing crystallites, whereby the average crystallite size is reduced by at least about 50% comprising the steps of:

A. Oxidizing said aged catalyst by contact with an oxidizing gas stream comprising oxygen at a first oxidation temperature in the range of about 15° to 35° C. for about 1 to 2 hours; then at a second oxidation temperature in the range

of about 40° to 70° C. for about 3 to 5 hours; then at a third oxidation temperature in the range of about 130° to 170° C. for about 2 to 5 hours; then at a fourth oxidation temperature in the range of about 190° to 230° C. for about 2 to 4 hours;

B. Contacting said aged catalyst with a stream of inert gas and allowing said aged catalyst to cool below a temperature of about 150° C.;



C. Reducing said aged catalyst by contact with a reducing gas stream for a period of time and at a temperature sufficient to reduce copper oxides contained in said catalyst and wherein the gas streams in steps A, B and C are added at flow rates of about 0.5 to about 3 SLPM/liter of reactor volume.

5,004,718

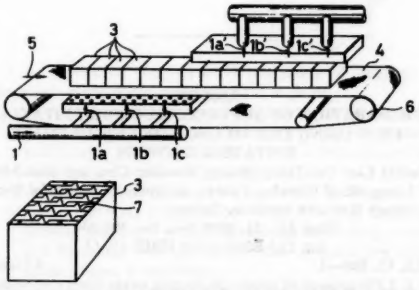
PROCESS FOR CALCINING A DENITRATING CATALYST

Nobuyoshi Ishida; Takashi Michimoto; Katsutaro Miyake, and Toshio Ichige, all of Kure, Japan, assignors to Babcock-Hitachi Kabushiko Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 134,367, Dec. 17, 1987, abandoned. This application Aug. 21, 1989, Ser. No. 396,472

Int. Cl.[5] B01J *27/053, 8/00*

U.S. Cl. 502—217 **11 Claims**



1. A process for calcining a sulfate containing denitrating catalyst used in exhaust gas denitration to uniformly reduce the sulfate content therein to a predetermined level, the process comprising the steps of:

arranging a plurality of catalyst units on a reticulate belt in a calcining furnace, the catalyst units formed subsequent to mixing oxides of metals including Ti, W and/or Mo and V in sulfuric acid, wherein the resulting catalysts include sulfate in excess of 7% by weight;

continuously moving the reticulate belt within the furnace;

flowing fresh hot air at a temperature in the range of about 350° C. to 600° C. through the denitrating catalyst units in a first hot air direction at a rate of about 0.1 to 0.9 m/sec to separate the sulfate from the catalyst units, resulting in first sulfate-contaminated air;

exhausting the first sulfate-contaminated air from the furnace;

flowing fresh hot air through the denitrating catalyst units in a second direction directly opposite the first hot air direction to pass fresh hot air at a temperature in the range of about 350° C. to 600° C. through the catalyst units in a second direction at a rate of about 0.1 to 0.9 m/sec to separate sulfate from the catalyst units, resulting in second sulfate-contaminated air;

exhausting the second sulfate-contaminated air from the furnace; and

controlling the rate of hot air flow in the first and second directions so that the content of sulfate group is uniformly reduced to about 4 to 7 percent by weight of the catalyst.

5,004,719

MOLDED ARTICLES BASED ON PYROGENICALLY PRODUCED ZIRCONIUM DIOXIDE METHOD FOR THEIR MANUFACTURE, AND USE THEREOF

Klaus Deller, Hainburg; Manfred Ettlinger, Karlstein; Rainhard Klingel, Alzenau, and Helmfried Krause, Rodenbach, all of Fed. Rep. of Germany, assignors to DEGUSSA Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 305,397, Feb. 2, 1989, abandoned. This application Feb. 23, 1990, Ser. No. 488,381

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1988, 3803898

Int. Cl.[5] B01J *21/06, 21/16*

U.S. Cl. 502—242 **4 Claims**

1. A molded article formed by pressing a composition comprising pyrogenically produced zirconium dioxide into a desired shape and firing, said molded article having the following properties:

outside diameter	2–15 mm
BET surface area per DIN 66 131	30–50 m^2/g
total pore volume	0.3–0.8 ml/g
pore size distribution	no pores < 10 nm, at least 80% of pores in 10–17 nm range
crushing strength	40–300 N
composition	at least 92% ZrO_2, remainder one or more of SiO_2, Al_2O, HfO_2.

4. A catalyst comprising the catalyst support formed of the molded article of claim 1 having a catalytically active substance deposited thereon.

5,004,720

PROCESS FOR PRODUCING A SUPERCONDUCTOR OF AN OXIDE SYSTEM FROM ACETYLACETONATES

Toshio Kobayashi; Fusaoki Uchikawa; Kenji Nomura; Masao Morita, and Shouichi Yokoyama, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1988, Ser. No. 235,542

Claims priority, application Japan, Aug. 24, 1987, 62-210923; Aug. 24, 1987, 210932; Aug. 24, 1987, 62-210935; Aug. 24, 1987, 62-210936; Aug. 24, 1987, 62-210949; Mar. 31, 1988, 63-81715; Apr. 18, 1988, 63-96277

Int. Cl.[5] C04B *35/00;* **H01B** *12/00, 13/00;* **H01L** *39/12*

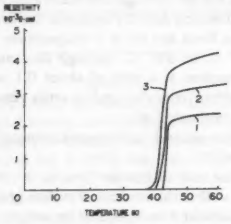
U.S. Cl. 505—1 **9 Claims**

1. A process for producing a superconductor of an oxide system, which comprises:

(a) uniformly mixing metal elements for constituting the oxide system at least partly in the form of acetylacetonates

in a solvent, to obtain a substantially homogeneous mixture,

(b) hydrolyzing said mixture with an alkaline substance, to form a gelled hydrolyzate,



(c) washing said gelled hydrolyzate to remove said alkaline substance therefrom,

(d) drying said washed hydrolyzate, and

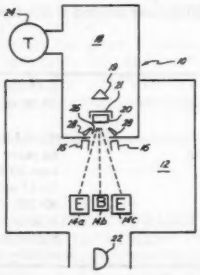
(e) sintering said dried hydrolyzate to form said superconductor of an oxide system.

5,004,721

AS-DEPOSITED OXIDE SUPERCONDUCTOR FILMS ON SILICON AND ALUMINUM OXIDE

A. L. DeLozanne, Austin, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex. and Motorola, Inc., Schaumburg, Ill.

Filed Nov. 3, 1988, Ser. No. 266,546
Int. Cl.[5] B05D *5/12, 3/06;* **C23C** *14/08*
U.S. Cl. 505—1 **12 Claims**



1. A method of preparing an as-deposited oxide superconductor film on a silicon or an aluminum oxide substrate which comprises the steps of:

(A) emplacing a substrate in a first vacuum chamber so that the substrate faces an opening in the first chamber which connects the first chamber to a second vacuum chamber;

(B) conductively heating the substrate to a temperature between 500° and 600° C.;

(C) introducing into the second vacuum chamber metallic superconductor precursor components in their gas states, said components dispersing through the opening into the first vacuum chamber;

(D) evacuating the first and second vacuum chambers at different rates to establish a greater vacuum in the second vacuum chamber than in the first vacuum chamber by a factor of between one and two orders of magnitude;

(E) directing a stream of plasm-excited oxygen over the substrate as the superconductor molecules are deposited, said oxygen pressure over the substrate being about one order of magnitude higher than the pressure in the first chamber; and

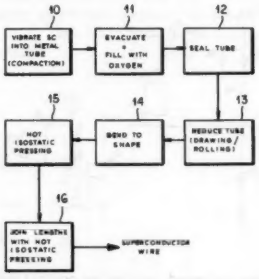
(F) allowing sufficient time for the production of the oxide superconductor film without need of post-annealing.

5,004,722

METHOD OF MAKING SUPERCONDUCTOR WIRES BY HOT ISOSTATIC PRESSING AFTER BENDING

Richard L. Tallman, Idaho Falls, Id., assignor to International Superconductor Corp., Riverdale, N.Y.

Filed Jan. 19, 1989, Ser. No. 300,285
Int. Cl.[5] H01L *39/24*
U.S. Cl. 505—1 **13 Claims**



1. A method of making a superconducting wire, comprising the steps of:

(a) introducing a ceramic superconductive material into a metal tube;

(b) evacuating ambient air from said tube after introduction of said superconductive material into said tube;

(c) backfilling said tube with oxygen;

(d) thereafter sealing said tube;

(e) subjecting said tube with said material contained therein and after sealing to cross section reduction and elongation, thereby compacting said tube against said material and compacting said material within said tube;

(f) thereafter bending said metal tube containing said superconductive material into a useful shape having at least one bend; and

(g) thereafter hot isostatically compressing said tube and said superconductive material within said tube at a pressure and temperature and for a duration sufficient such that said tube is collapsed onto said material and voids and cracks in said superconductive material in said tube are healed.

5,004,723

PREPARATION OF SUPERCONDUCTING EPITAXIAL FILM USING THE METHOD OF LIQUID-PHASE EPITAXIAL GROWTH

Ru-Shi Liu; Yao-Tsung Huang; Jau-Jier Chu, and Jiuh-Ming Liang, all of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Taiwan

Filed Jan. 31, 1989, Ser. No. 305,004
Int. Cl.[5] B01D *9/00;* **H01L** *39/12*
U.S. Cl. 505—1 **4 Claims**

1. LPE growth of super conducting oxide films comprising the steps of:

(a) melting the oxides of bismuth, calcium, strontium, and copper or the oxides of thallium, calcium, barium, and copper at temperature in the range of 900° C. to 950° C. to form a melt;

(b) contacting the melt in (a) with magnesium oxide or single crystalline materials;

(c) lowering the temperature of the melt at a rate of 0.3°–2° C./min. until the temperature is within the range of 820° C. to 890° C.;

(d) separating the melt and the magnesium oxide substrate or

single crystalline material to obtain a superconducting epitaxial film; and

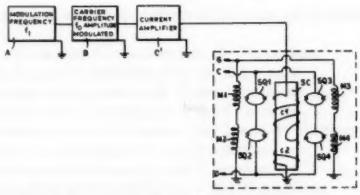
(e) cooling said film in (d) until the temperature thereof is at room temperature, whereby a superconducting epitaxial film having a thickness of 40 to 150 μm is obtained.

5,004,724

SUPERCONDUCTIVE QUANTUM INTERFERENCE DEVICE FOR THE NON-DESTRUCTIVE EVALUATION OF METALS

Dilip K. De, Winston-Salem, N.C., assignor to International Superconductor Corp., Riverdale, N.Y.

Filed Mar. 9, 1989, Ser. No. 321,263
Int. Cl.[5] G01N *27/82*
U.S. Cl. 505—1 **15 Claims**



1. A method of nondestructive evaluation of locations of flaws in a metal body, comprising the steps of:

(a) positioning a high-critical-temperature superconductive quantum interference device having a pair of insulated junctions in a superconductor loop in a flux-sensing relationship to a location adjoining said body;

(b) relatively displacing said body and said location;

(c) while said body and said location are relatively displaced, exciting said body with a modulated alternating current and detecting with said device flux irregularities representing flaws in said body;

(d) establishing locations of said flaws by the relative positions of said location and said body upon the detection of said flux irregularities, a plurality of said devices being connected in series are juxtaposed with said body;

(e) demodulating a signal generated by the series-connected devices to form an output; and

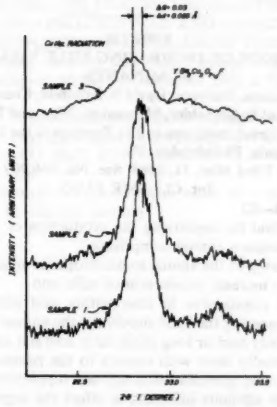
(f) connecting respective modulating coils inductively coupled to the respective high-critical-temperature superconductive quantum interference devices and connected to said output in a feedback path to form a flux-locked loop with said high-critical-temperature superconductive quantum interference devices.

5,004,725

PARAMETRICALLY MODIFIED SUPERCONDUCTOR MATERIAL

Stanford R. Ovshinsky, Bloomfield Hills, and Rosa Young, Troy, both of Mich., assignors to Ovonic Synthetic Materials Company Inc., Troy, Mich.

Continuation of Ser. No. 43,279, Apr. 27, 1989, abandoned. This application Nov. 27, 1989, Ser. No. 441,847
Int. Cl.[5] C04B *35/00*
U.S. Cl. 505—1 **1 Claim**



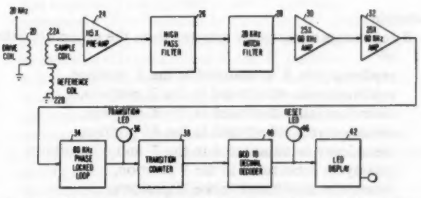
1. In a perovskite defect oxide superconductor composition having a phase of the $Y_1Ba_2Cu_3O_7$ with an X-ray crystallographic peak at about 22.85 degrees two theta, the improvement wherein the composition further comprises F, said F being incorporated into the defect oxide superconductor phase in an amount sufficient to shift the x-ray cyrstallographic peak 0.05 degrees two theta to about 22.80 degrees two theta, and change the interplanar spacing corresponding to said peak by about 0.025 Angstrom.

5,004,726

APPARATUS AND METHODOLOGY FOR THE NON-CONTACT TESTING OF MATERIALS FOR SUPERCONDUCTIVITY BY DETECTING ODD HARMONICS ABOVE A THRESHOLD

Avner A. Shaulov, Monsey; Samuel P. Herko, Ossining; Donald R. Dorman, Tarrytown, and Rameshwar N. Bhargava, Ossining, all of N.Y., assignors to North American Philips Corp., New York, N.Y.

Filed Jul. 14, 1989, Ser. No. 380,162
Int. Cl.[5] G01R *33/12*; G01N *27/72*; H01L *39/00*
U.S. Cl. 505—1 **11 Claims**



1. A device for determining if a sample of material is a superconductor, comprising:

means for inducing an alternating magnetic field in the sample of material to be tested;

means for measuring the amplitude of the odd numbered

harmonic component of the magnetic field induced in the sample to be tested;

means connected to said measuring means for determining if the amplitude of the odd numbered harmonic has exceeded a predetermined threshold amplitude; and

means connected to said amplitude determining means for indicating that the threshold amplitude has been exceeded to indicate that a superconducting transition has occurred.

5,004,727

Patent Not Issued For This Number

5,004,728

METHODS OF INCREASING MILK YIELDS IN RUMINANTS

William Chalupa, Malvern; David S. Kronfeld, Coatesville, both of Pa.; Paul L. Schneider, Milwaukee, Wis., and David Sklan, Rehovot, Israel, assignors to The Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Mar. 11, 1988, Ser. No. 166,709

Int. Cl.[5] A61K *37/36*

U.S. Cl. 514—12 **26 Claims**

1. A method for improving the production of milk from a lactating ruminant animal comprising:

administering to the animal somatotropin in an amount sufficient to increase production of milk; and

generally coextensive in time within said administration, supplementing the food supply for the animal with a long chain fatty acid or long chain fatty acid salt selected to be substantially inert with respect to the rumination of the animal; said administration and said supplementation each being in amounts sufficient to effect the improvement in production.

5,004,729

AROMATIC ESTERS OF MACROLIDIC AND LINCOSAMIDIC ANTIBIOTICS AND PHARMACEUTICAL AND COSMETIC COMPOSITIONS CONTAINING THEM

Michel Philippe, Antony, and Henri Sebag, Paris, both of France, assignors to Societe Anonyme Dite: L'Oreal, Paris, France

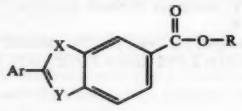
Filed Nov. 3, 1988, Ser. No. 266,862

Claims priority, application Luxembourg, Nov. 4, 1987, 87038

Int. Cl.[5] A61K *31/70*; C07H *15/16, 17/08*

U.S. Cl. 514—29 **9 Claims**

1. An aromatic ester of a macrolide or lincosamide having the formula



(I)

wherein

R represents a macrolide selected from the group consisting of:

erythromycin A substituted in the 2′ position,
roxithromycin substituted in the 2′ position,
oleandomycin substituted in the 2′ position,
oleandomycin substituted in the 4″ position,
oleandomycin substituted in the 2′ and 4″ positions,
josamycin substituted in the 9 position,
josamycin substituted in the 2′ position,
josamycin substituted in 9 and 2′ positions,
spiramycin (I) substituted in the 2′ position,
spiramycin (I) substituted in the 4″ position,
spiramycin (I) substituted in the 2′ and 4″ positions,
spiramycin (II) substituted in the 2′ position,
spiramycin (II) substituted in the 4″ position,
spiramycin (II) substituted in the 2′ and 4″ positions,
spiramycin (III) substituted in the 2′ position,
spiramycin (III) substituted in the 4″ position,
spiramycin (III) substituted in the 2′ and 4″ positions,

or R represents a lincosamide selected from the group consisting of:

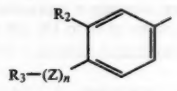
lincomycin substituted in the 3 position,
clindamycin substituted in the 3 position,
lincomycin substituted in the 2, 4 and 7 positions and
clindamycin substituted in the 2 and 4 positions,

Y represents CH or a nitrogen atom,

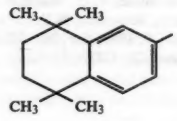
when Y represents CH, X represents a vinylene radical, an oxygen atom, a sulfur atom or NR_1 wherein R_1 is hydrogen or methyl,

when Y represents a nitrogen atom, X represents a sulfur atom, an oxygen atom or NH,

Ar represents an aromatic radical having one of the following formulas:

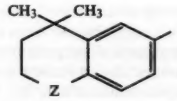


(a)



(b)

and



(c)

wherein

n is 0 or 1,

R_2 and R_3 represent hydrogen, linear or branched alkyl having 1–15 carbon atoms or cycloalkyl having 5–10 carbon atoms, and

Z is an oxygen atom or a sulfur atom,

and mixtures and salts of said esters.

3. A pharmaceutical or cosmetic composition for the treatment of dermatoses comprising in an anhydrous vehicle, as the active component, a pharmaceutically or cosmetically effective amount of at least one ester of claim 1.

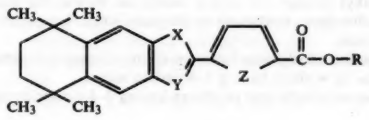
5,004,730

POLYCYCLIC AROMATIC ESTERS OF MACROLIDIC AND LINCOSAMIDIC ANTIBIOTICS AND PHARMACEUTICAL AND COSMETIC COMPOSITIONS CONTAINING THEM

Michel Philippe, Antony, and Henri Sebag, Paris, both of France, assignors to L'Oreal, Paris, France

Filed Nov. 3, 1988, Ser. No. 266,599
Claims priority, application Luxembourg, Nov. 4, 1987, 87040
Int. Cl.[5] A61K *31/70*; C07H *15/16, 17/08*
U.S. Cl. 514—029 9 Claims

1. An polycyclic aromatic ester of a macrolide or lincosamide having the formula



(I)

wherein

R represents a macrolide selected from the group consisting of:
erythromycin A substituted in the 2′ position,
roxithromycin substituted in the 2′ position,
oleandomycin substituted in the 2′ position,
oleandomycin substituted in the 4″ position,
oleandomycin substituted in the 2′ and 4″ positions,
josamycin substituted in the 9 position,
josamycin substituted in the 2′ position,
josamycin substituted in the 9 and 2′ positions,
spiramycin (I) substituted in the 2′ position,
spiramycin (I) substituted in the 4″ position,
spiramycin (I) substituted in the 2′ and 4″ positions,
spiramycin (II) substituted in the 2′ position,
spiramycin (II) substituted in the 4″ position,
spiramycin (II) substituted in the 2′ and 4″ positions,
spiramycin (III) substituted in the 2′ position,
spiramycin (III) substituted in the 4″ position,
spiramycin (III) substituted in the 2′ and 4″ positions,
or R represents a lincosamide selected from the group consisting of:
lincomycin substituted in the 3 position,
clindamycin substituted in the 3 position,
lincomycin substituted in the 2, 4 and 7 positions and clindamycin substituted in the 2 and 4 positions,
Y represents CH or a nitrogen atom,
when Y represents CH, X represents vinylene radical, an oxygen atom, a sulfur atom or NR,
when Y represents a nitrogen atom, X represents an oxygen atom, a sulfur atom or NH,
Z represents a vinylene radical, an oxygen atom, a sulfur atom, or NR_2 and
R_1 and R_2 represent hydrogen or methyl and the mixtures and salts of said esters.

3. A pharmaceutical or cosmetic composition for the treatment of dermatoses comprising in an anhydrous vehicle, as the active component, a pharmaceutically or cosmetically effective amount of at least one ester of claim 1.

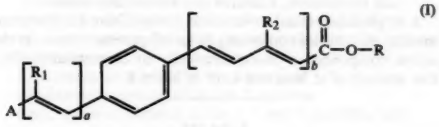
5,004,731

UNSATURATED CYCLOALIPHATIC ESTERS OF MACROLIDIC AND LINCOSAMIDIC ANTIBIOTICS AND PHARMACEUTICAL AND COSMETIC COMPOSITIONS CONTAINING THEM

Michel Philippe, Antony, and Henri Sebag, Paris, both of France, assignors to Societe Anonyme Dite: L'Oreal, Paris, France

Filed Nov. 3, 1988, Ser. No. 266,598
Claims priority, application Luxembourg, Nov. 4, 1987, 87036
Int. Cl.[5] A61K *31/70*; C07M *15/16, 17/08*
U.S. Cl. 514—29 9 Claims

1. An unsaturated cycloaliphatic ester of a macrolide or lincosamide having the formula



(I)

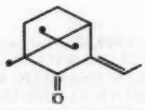
wherein

R represents a macrolide selected from the group consisting of:
erythromycin A substituted in the 2′ position,
roxithromycin substituted in the 2′ position,
oleandomycin substituted in the 2′ position,
oleandomycin substituted in the 4″ position,
oleandomycin substituted in the 2′ and 4″ positions,
josamycin substituted in the 9 position,
josamycin substituted in the 2′ position,
josamycin substituted in the 9 and 2′ positions,
spiramycin (I) substituted in the 2′ position,
spiramycin (I) substituted in the 4″ position,
spiramycin (I) substituted in the 2′ and 4″ positions,
spiramycin (II) substituted in the 2′ position,
spiramycin (II) substituted in the 4″ position,
spiramycin (II) substituted in the 2′ and 4″ positions,
spiramycin (III) substituted in the 2′ position,
spiramycin (III) substituted in the 4″ position,
spiramycin (III) substituted in the 2′ and 4″ positions,
or R represents a lincosamide selected from the group consisting of:
lincomycin substituted in the 3 position,
clindamycin substituted in the 3 position,
lincomycin substituted in the 2, 4 and 7 positions and clindamycin substituted in the 2 and 4 positions,
R_1 and R_2, each independently, represent hydrogen or alkyl having 1-4 carbon atoms,

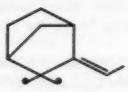
a and b are 0 or 1 with the proviso that at least one of a and b is equal to 1,

and A represents a radical selected from the group consisting of

(i)

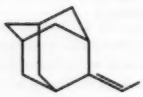


(ii)



and

(iii)



and the isomers, mixtures and salts of said ester.

3. A pharmaceutical or cosmetic composition for the treatment of dermatoses comprising in an anhydrous vehicle, as the active component, a pharmaceutically or cosmetically effective amount of at least one ester of claim 1.

5,004,732

POLYAROMATIC ESTERS OF MACROLIDIC AND LINCOSAMIDIC ANTIPIOTICS AND PHARMACEUTICAL AND COSMETIC COMPOSITIONS CONTAINING THEM

Michel Philippe, Antony, and Henri Sebag, Paris, both of France, assignors to Societe Anonyme Dite: L'Oreal, Paris, France

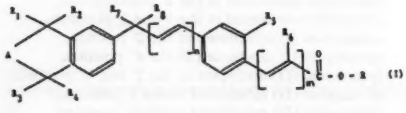
Filed Nov. 3, 1988, Ser. No. 266,596

Claims priority, application Luxembourg, Nov. 4, 1987, 87037

Int. Cl.[5] A61K *31/70*; C07H *15/16, 17/08*

U.S. Cl. 514—29 **9 Claims**

1. A polyaromatic ester of a macrolide or lincosamide having the formula



(I)

wherein

R represents a macrolide selected from the group consisting of:

erythromycin A substituted in the 2' position,
roxithromycin substituted in the 2' position,
oleandomycin substituted in the 2' position,
oleandomycin substituted in the 4" position,
oleandomycin substituted in the 2' and 4" positions,
josamycin substituted in the 9 position,
josamycin substituted in the 2' position,
josamycin substituted in the 9 and 2' positions,
spiramycin (I) substituted in the 2' position,
spiramycin (I) substituted in the 4" position,
spiramycin (I) substituted in the 2' and 4" positions,
spiramycin (II) substituted in the 2' position,
spiramycin (II) substituted in the 4" position,
spiramycin (II) substituted in the 2' and 4" positions,
spiramycin (III) substituted in the 2' position,
spiramycin (III) substituted in the 4" position,
spiramycin (III) substituted in the 2' and 4" positions,

or R represents a lincosamide selected from the group consisting of:

lincomycin substituted in the 3 position,
clindamycin substituted in the 3 position,
lincomycin substituted in the 2, 4 and 7 positions and
clindamycin substituted in the 2 and 4 positions,

n and m are 0 or 1 with the proviso that n and m are not simultaneously equal to 1,

A represents methylene or ethylene, unsubstituted or substituted by lower alkyl having 1–4 carbon atoms,

R_1, R_2, R_3 and R_4, each independently, represent hydrogen or alkyl having 1–6 carbon atoms, or R_1 and R_3 taken together from methylene or ethylene when A represents ethylene,

R_7 represents hydrogen, hydroxy, alkoxy having 1–4 carbon atoms or acyloxy having 1–4 carbon atoms,

R_8 represents hydrogen or alkoxy having 1–4 carbon atoms, or

R_7 and R_8 taken together form an oxo or methano radical, and

R_5 and R_6 represent hydrogen or methyl, or

R_5 and R_6, taken together, form a vinylene radical,

and the isomers, mixtures and salts of said esters.

3. A pharmaceutical or cosmetic composition for the treatment of dermatoses comprising in an anhydrous vehicle, as the active component, a pharmaceutically or cosmetically effective amount of at least one ester of claim 1.

5,004,733

ESTERS OF THE ETRETINIC TYPE OR RELATED TO MACROLIDIC AND LINCOSAMIDIC ANTIBIOTICS AND PHARMACEUTICAL AND COSMETIC COMPOSITIONS CONTAINING SAID ESTERS

Michel Philippe, Antony, and Henri Sebag, Paris, both of France, assignors to Societe Anonyme Dite: L'Oreal, Paris, France

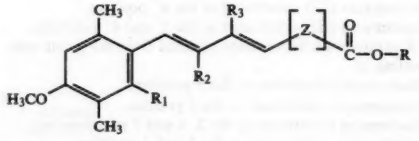
Filed Nov. 3, 1988, Ser. No. 266,611

Claims priority, application Luxembourg, Nov. 4, 1987, 87035

Int. Cl.[5] A61K *31/70*; C07H *15/16, 17/08*

U.S. Cl. 514—029 **9 Claims**

1. An ester of the etretinic type or related to a macrolide or lincosamide having the formula



(I)

wherein

R represents a macrolide selected from the group consisting of:

erythromycin A substituted in the 2' position,
roxithromycin substituted in the 2'position,
oleandomycin substituted in the 2' position,

oleandomycin substituted in the 4″ position,
oleandomycin substituted in the 2′ and 4″ positions,
josamycin substituted in the 9 position,
josamycin substituted in the 2′ position,
josamycin substituted in the 9 and 2′ positions,
spiramycin (I) substituted in the 2′ position,
spiramycin (I) substituted in the 4″ position,
spiramycin (I) substituted in the 2′ and 4″ positions,
spiramycin (II) substituted in the 2′ position,
spiramycin (II) substituted in the 4″ position,
spiramycin (II) substituted in the 2′ and 4″ positions,
spiramycin (III) substituted in the 2′ position,
spiramycin (III) substituted in the 4″ position,
spiramycin (III) substituted in the 2′ and 4″ positions,

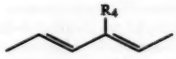
or R represents a lincosamide selected from the group consisting of:
lincomycin substituted in the 3 position,
clindamycin substituted in the 3 position,
lincomycin substituted in the 2, 4 and 7 positions and
clindamycin substituted in the 2 and 4 positions,

R_1 represents methyl,

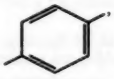
R_2 represents hydrogen, or R_1 and R_2 together form a vinylene (—CH=CH—) radical,

R_3 represents hydrogen or alkyl having 1–4 carbon atoms, and

Z represents a divalent radical (1) of the formula



wherein R_4 represents hydrogen or alkyl having 1–4 carbon atoms or (2) of the formula the isomers, mixtures and salts of said ester.



3. A pharmaceutical or cosmetic composition for the treatment of dermatoses comprising in an anhydrous vehicle, as the active component, a pharmaceutically or cosmetically effective amount of at least one ester of claim 1.

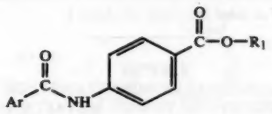
5,004,734

DIAROMATIC ESTERS OF MACROLIDIC AND LINCOSAMIDIC ANTIBIOTICS AND PHARMACEUTICAL AND COSMETIC COMPOSITIONS CONTAINING THEM

Michel Philippe, Antony, and Henri Sebag, Paris, both of France, assignors to Societe Anonyme Dite: L'Oreal, Paris, France

Filed Nov. 3, 1988, Ser. No. 266,597
Claims priority, application Luxembourg, Nov. 4, 1987, 87039
Int. Cl.[5] A61K *31/70;* **C07H** *15/16, 17/08*
U.S. Cl. 514—29 **9 Claims**

1. A diaromatic ester of a macrolide or lincosamide having the formula



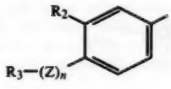
(I)

wherein

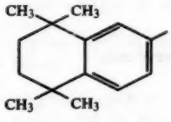
R_1 represents a macrolide selected from the group consisting of:
erythromycin A substituted in the 2′ position,
roxithromycin substituted in the 2′ position,
oleandomycin substituted in the 2′ position,
oleandomycin substituted in the 4″ position,
oleandomycin substituted in the 2′ and 4″ positions.
josamycin substituted in the 9 position,
josamycin substituted in the 2′ position,
josamycin substituted in the 9 and 2′ positions,
spiramycin (I) substituted in the 2′ position,
spiramycin (I) substituted in the 4″ position,
spiramycin (I) substituted in the 2′ and 4″ positions,
spiramycin (II) substituted in the 2′ position,
spiramycin (II) substituted in the 4″ position,
spiramycin (II) substituted in the 2′ and 4″ positions,
spiramycin (III) substituted in the 2′ position,
spiramycin (III) substituted in the 4″ position,
spiramycin (III) substituted in the 2′ and 4″ positions,

or R_1 represents a lincosamide selected from the group consisting of:
lincomycin substituted in the 3 position,
clindamycin substituted in the 3 position,
lincomycin substituted in the 2, 4 and 7 positions and
clindamycin substituted in the 2 and 4 positions,

Ar represents an aromatic radical selected from

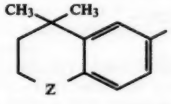


(a)



(b)

and



(c)

wherein

n is 0 or 1,

R_2 and R_3 represent hydrogen, linear or branched alkyl having 1–15 carbon atoms or cycloalkyl having 5–10 carbon atoms, and

Z is an atom of oxygen or sulfur,

and mixtures and salts of said esters.

3. A pharmaceutical or cosmetic composition for the treatment of dermatoses comprising in an anhydrous vehicle, as the active component, a pharmaceutically or cosmetically effective amount of at least one ester of claim 1.

5,004,735

PHARMACEUTICAL COMPOSITIONS FOR THE INHIBITION OF TUMOR METASTASIS

Yasushi Okamoto, Tokyo; Yoshiyuki Tahara, and Yoshio Mishima, both of Saitama, all of Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

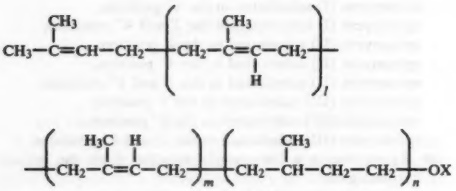
Filed Jun. 29, 1989, Ser. No. 373,909

Claims priority, application Japan, Jul. 13, 1988, 63-172638

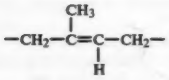
Int. Cl.[5] A61K *31/66, 31/045*

U.S. Cl. 514—134 **8 Claims**

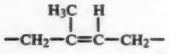
1. An oily emulsion for the inhibition of lung metastasis in a mammal which comprises an an active ingredient an effective amount to inhibit lung metastasis of one or more of polyprenols and polyprenyl phosphates of the formula



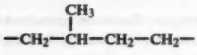
wherein



represents a trans-isoprene unit,



represents a cis-isoprene unit,



-continued

represents a dihydroisoprene unit, l is an integer of 2 to 8, m is 0 or an integer of 5 to 18, n is 0 or 1, the sum of l and m is the range of 8 to 20, X represents a hydrogen atom or —PO_3MM' wherein M and M' may be the same or different and each is a hydrogen atom or a monovalent cation or both M and M' together form a divalent cation.

5,004,736

PROCEDURE FOR OBTAINING THE PREPARATION FOR THE TREATMENT OF THE DISEASE PSORIASIS: DRUG FOR THE TREATMENT OF PSORIASIS AND ITS APPLICATION

Pero Visnjic, Mose Pijade 3, 58300 Makarska, Yugoslavia

Continuation of Ser. No. 875,221, Jun. 17, 1986, abandoned. This application Jun. 23, 1989, Ser. No. 370,121

Claims priority, application Yugoslavia, Feb. 14, 1986, 221/86

Int. Cl.[5] A61K *31/62, 31/56*

U.S. Cl. 514—161 **2 Claims**

1. A process for preparing a medicinal ointment for the treatment of psoriasis, consisting of the steps of:

preparing a vehicle for a medicinal ointment by homogenizing the ingredients, melting at 150° C., and cooling to 85°–90° C., with stirring for 20 minutes,

emulsifying the vehicle with demineralized sterile water, sterilizing the resultant emulsion 30 minutes at 85°–90° C., cooling the emulsion to 60° C.,

adding 9-fluoro-11β,17,21-trihydroxy-16β-methyl-pregna-1,4-diene-3,20-dion-17,21-dipropionate and 6,9-difluoro-11,16,17,21-tetrahydroxy-pregna-1,4-diene-3,20-dion-21-acetate-16,17-acetonide dissolved in suitable sterile solvents to the emulsion, while stirring, said 9-fluoro-11β,17,21-trihydroxy-16β-methyl-pregna-1,4-diene-3,20-dion-17,21-dipropionate and, 6,9-difluoro-11,16,17,21-tetrahydroxy-pregna-1,4-diene-3,20-dion-21-acetate-16,17-acetonide being added in a ratio of 1:1; and then

adding the following ingredients, while stirring: gentamycin sulfate, vitamin A palmitate wherein the gentamycin sulfate is added in an amount equivalent to at least 35000 IU/100 g of the ointment, and wherein vitamin A palmitate is added in an amount equivalent to 30000 IU/100 g of the ointment, and 2,4-dihydroxy-N-(3-hydroxypropyl)-3,3-dimethylbutanamide, 0.5 g per 100 g of ointment; and then

adding salicylic acid at 7% by weight of the ointment; and homogenizing and cooling the resulting medicinal ointment.

5,004,737

QUATERNARY AMMONIUM-SUBSTITUTED STEROL DERIVATIVES

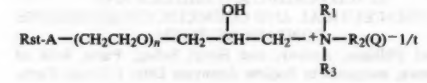
Young D. Kim, and Byung J. Ha, both of Seoul, Rep. of Korea, assignors to Pacific Chemical Co., Ltd., Seoul, Rep. of Korea

Filed Sep. 22, 1989, Ser. No. 411,411

Int. Cl.[5] A61K *31/575;* **C07J** *41/00*

U.S. Cl. 514—182 **6 Claims**

1. A quaternary ammonium-substituted sterol compound of the following formula (I):



(I)

wherein Q represents an anion of a strong inorganic acid, R_1 represents alkyl or a monounsaturated alkenyl group having up to 18 carbon atoms; R_2 and R_3, the same or different from each other, are methyl or ethyl groups; t is the valence of Q; A represents an oxygen atom; n is an integer of 0 to 25; and Rst represents a sterol selected from the group consisting of sitos-

terol, campesterol, stigmasterol, cholesterol, and lanosterol or a stanol obtained by the reduction of the double bond between carbon atoms 5 and 6 of said sterols.

5,004,738

1,1-DIOXOPENICILLANOYL OXYMETHYL D-6-(α-(METHYLENEAMINO) PHENYLACETAMIDO)-PENICILLANATE AND A PROCESS FOR THE PREPARATION THEREOF

Young Sul Kim, Cosmos Mansion 1002, #302-62 Ichon-Dong, Yongsan-Ku, Seoul, Rep. of Korea

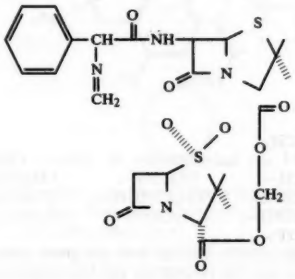
Filed Jul. 24, 1989, Ser. No. 383,435

Claims priority, application Rep. of Korea, Jun. 20, 1989, 89-8501

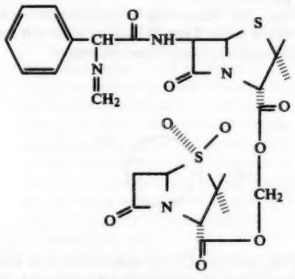
Int. Cl.[5] A61K *31/43*; C07D *499/08, 499/32*

U.S. Cl. 514—195 **8 Claims**

1. A pharmaceutical compound of 1,1-dioxopenicillanoyl oxymethyl-D-6-[α-(methyleneamino) phenylacetamido]-penicillanate or pharmaceutically acceptable salt thereof represented by the following formulas (I) and (I'):



(I)



(I')

wherein Me is hydrochloride, sulfuric acid, phosphoric acid, maleic acid, succinic acid, methanesulfonic acid, or p-toluenesulfonic acid.

6. The method for treating a bacterial infection in a mammal in need thereof which comprises administrating orally to said mammal an antibacterially effective amount of the pharmaceutical compound of claim 1.

5,004,739

2-PHENANTHRENYL CARBAPENEM ANTIBACTERIAL AGENTS

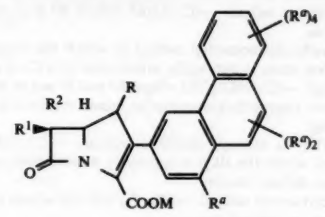
Frank P. DiNinno, Old Bridge; Mark L. Greenlee, Rahway, and Thomas N. Salzmann, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 26, 1990, Ser. No. 544,286

Int. Cl.[5] C07D *481/04*; A61K *31/40*

U.S. Cl. 514—210 **13 Claims**

1. A compound of the formula:



(I)

wherein:

R is H or CH_3;

R^1 and R^2 are independently H, CH_3—, CH_3CH_2—, $(CH_3)_2CH$—, $HOCH_2$—, $CH_3CH(OH)$—, $(CH_3)_2C(OH)$—, $FCH_2CH(OH)$—, $F_2CHCH(OH)$—, $F_3CCH(OH)$—, $CH_3CH(F)$—, CH_3CF_2—, or $(CH_3)_2C(F)$—;

R^q is a member selected from the group consisting of—OH, —OCH_3, —CN, —C(O)NH_2, —OC(O)NH_2, CHO, —OC(O)$N(CH_3)_2$, —SO_2NH_2, —$SO_2N(CH_3)_2$,

(a) a trifluoromethyl group: —CF_3;

(b) a halogen atom: —Br, —Cl, —F, or —I;

(c) C_1–C_4 alkoxy radical: —OC_{1-4} alkyl, wherein the alkyl is optionally mono-substituted by R^q, where

R^t is a member selected from the group consisting of —OH, —OCH_3, —CN, —C(O)NH_2, —OC(O)NH_2, CHO, —OC(O)$N(CH_3)_2$, —SO_2NH_2, —$SO_2N(CH_3)_2$, —$SOCH_3$, —SO_2CH_3, —F, —CF_3, —$COOM^a$ (where M^a is hydrogen, alkali metal, methyl or phenyl), tetrazolyl (where the point of attachment is the carbon atom of the tetrazole ring and one of the nitrogen atoms is mono-substituted by M^a as defined above) and —SO_3M^b (where M^b is hydrogen or an alkali metal);

(d) a hydroxy group: —OH;

(e) a carbonyloxy radical: —O(C═O)R^s, where

R^s is C_{1-4} alkyl or phenyl, each of which is optionally mono-substituted by R^q as defined above;

(f) a carbamoyloxy radical: —O(C═O)$N(R^y)R^z$ where

R^y and R^z are independently H, C_{1-4} alkyl (optionally mono-substituted by R^q as defined above), together a 3- to 5-membered alkylidene radical to form a ring (optionally substituted with R^q as defined above) or together a 2- to 4-membered alkylidene radical, interrupted by —O—, —S—, —S(O)— or —$S(O)_2$—, to form a ring (where the ring is optionally mono-substituted with R^q as defined above);

(g) a sulfur radical: —$S(O)_n$—R^s where n=0–2, and R^s is defined above;

(h) a sulfamoyl group: —$SO_2N(R^y)R^z$ where R^y and R^z are as defined above;

(i) azido: N_3

(j) a formamido group: —$N(R^t)$(C═O)H, where

R^t is H or C_{1-4} alkyl, and the alkyl thereof is optionally mono-substituted by R^q as defined above;

(k) a (C_1–C_4 alkyl)carbonylamino radical: —$N(R^t)$(C═O)C_{1-4} alkyl, where R^t is as defined above, and the alkyl group is also optionally mono-substituted by R^q as defined above;

(l) a (C_1–C_4 alkoxy) carbonylamino radical: —$N(R^t)$(C═O)OC_{1-4} alkyl, where R^t is as defined above, and the alkyl group is also optionally mono-substituted by R^q as defined above;

(m) a ureido group: —$N(R^t)$(C═O)$N(R^y)R^z$ where R^t, R^y and R^z are as defined above;

(n) a sulfonamido group: —$N(R^t)SO_2R^s$, where R^s and R^t are as defined above;

(o) a cyano group: —CN;

(p) a formyl or acetalized formyl radical: —(C═O)H or —$CH(OCH_3)_2$;

(q) (C_1–C_4 alkyl)carbonyl radical wherein the carbonyl is

acetalized: —C(OCH$_3$)$_2$C$_{1-4}$ alkyl, where the alkyl is optionally mono-substituted by R^q as defined above;

(r) carbonyl radical: —(C=O)R^s, where R^s is as defined above;

(s) a hydroximinomethyl radical in which the oxygen or carbon atom is optionally substituted by a C$_1$–C$_4$ alkyl group: —(C=NOR^z)R^y where R^y and R^z are as defined above, except they may not be joined together to form a ring;

(t) a (C$_1$–C$_4$ alkoxy) carbonyl radical: —(C=O)OC$_{1-4}$ alkyl, where the alkyl is optionally mono-substituted by R^q as defined above;

(u) a carbamoyl radical: —(C=O)N(R^y)R^z where R^y and R^z are as defined above;

(v) an N-hydroxycarbamoyl or N(C$_1$–C$_4$ alkoxy)carbamoyl radical in which the nitrogen atom may be additionally substituted by a C$_1$–C$_4$ alkyl group: —(C=O)—N(OR^y)R^z where R^y and R^z are as defined above, except they may not be joined together to form a ring;

(w) a thiocarbamoyl group: —(C=S)N(R^y)(R^z) where R^y and R^z are as defined above;

(x) carboxyl: —COOM^b, where M^b is as defined above;

(y) thiocyanate: —SCN;

(z) trifluoromethylthio: —SCF$_3$;

(aa) tetrazolyl, where the point of attachment is the carbon atom of the tetrazole ring and one of the nitrogen atoms is mono-substituted by hydrogen, an alkali metal or a C$_1$–C$_4$ alkyl optionally substituted by R^q as defined above;

(ab) an anionic function selected from the group consisting of: phosphono [P=O(OM^b)$_2$]; alkylphosphono {P=O(OM^b)—[O(C$_1$–C$_4$ alkyl)]}; alkylphosphinyl [P=O(OM^b)—(C$_1$–C$_4$ alkyl)]; phosphoramido [P=O-(OM^b)N(R^y)R^z and P=O(OM^b)NHR^x]; sulfino (SO$_2$M^b); sulfo (SO$_3$M^b); acylsulfonamides selected from the structures CONM^{b}SO$_2$R^x, CONM^{b}SO$_2$N-(R^y)R^z, SO$_2$NM^{b}CON(R^y)R^z; and SO$_2$NM^{b}CN, where R^x is phenyl or heteroaryl, where heteroaryl is a monocyclic aromatic hydrocarbon group having 5 or 6 ring atoms, in which a carbon atom is the point of attachment, in which one of the carbon atoms has been replaced by a nitrogen atom, in which one additional carbon atom is optionally replaced by a heteroatom selected from O or S, and in which from 1 to 2 additional carbon atoms are optionally replaced by a nitrogen heteroatom, and where the phenyl and heteroaryl are optionally mono-substituted by R^q, as defined above; M^b is as defined above; and R^y and R^z are as defined above;

(ac) C$_5$–C$_7$ cycloalkyl group in which one of the carbon atoms in the ring is replaced by a heteroatom selected from O, S, NH or N(C$_1$–C$_4$ alkyl) and in which one additional carbon atom may be replaced by NH or N(C$_1$–C$_4$ alkyl), and in which at least one carbon atom adjacent to each nitrogen heteroatom has both of its attached hydrogen atoms replaced by one oxygen thus forming a carbonyl moiety and there are one or two carbonyl moieties present in the ring;

(ad) C$_2$–C$_4$ alkenyl radical, optionally mono-substituted by one of the substituents (a) to (ac) above and phenyl which is optionally substituted by R^q as defined above;

(ae) C$_2$–C$_4$ alkynyl radical, optionally mono-substituted by one of the substituents (a) to (ac) above;

(af) C$_1$–C$_4$ alkyl radical;

(ag) C$_1$–C$_4$ alkyl mono-substituted by one of the substituents (a)–(ac) above;

(ah) a 2-oxazolidinonyl moiety in which the point of attachment is the nitrogen atom of the oxazolidinone ring, the ring oxygen atom is optionally replaced by a heteroatom selected from —S— and NR^t (where R^t is as defined above) and one of the saturated carbon atoms of the oxazolidinone ring is optionally mono-substituted by one of the substituents (a) to (ag) above;

M is selected from:

(i) hydrogen;

(ii) a pharmaceutically acceptable esterifying group or removable carboxyl protecting group; or

(iii) an alkali metal or other pharmaceutically acceptable cation.

5,004,740

2-PHENANTHRENYL-CARBAPENEM ANTIBACTERIAL AGENTS

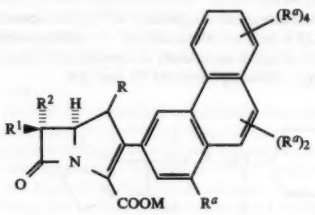
Frank P. Dininno, Old Bridge; Thomas N. Salzmann, North Plainfield, and Mark L. Greenlee, Rahway, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 26, 1990, Ser. No. 543,990

Int. Cl.^{5} C07D *487/04;* A61K *31/40*

U.S. Cl. 514—210 **21 Claims**

1. A compound of the formula:



(I)

wherein:

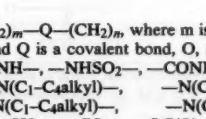
R is H or CH$_3$;

R^1 and R^2 are independently H, CH$_3$—, CH$_3$CH$_2$—, (CH$_3$)$_2$CH—, HOCH$_2$—, CH$_3$CH(OH)—, (CH$_3$)$_2$C(OH)—, FCH$_2$CH(OH)—, F$_2$CHCH(OH)—, F$_3$CCH(OH)—, CH$_3$CH(F)—, CH$_3$CF$_2$—, or (CH$_3$)$_2$C(F)—;

R^a are independently selected from the group consisting of hydrogen and the radicals set out below, provided that one but not more than one R^a is selected from Type I substituents, the remaining non-hydrogen substituents being selected from Type II, and in total not more than four R^a radicals are other than hydrogen:

I.

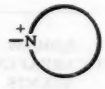
(a)



;

where

A is (CH$_2$)$_m$—Q—(CH$_2$)$_n$, where m is 0 to 6 and n is 1 to 6 and Q is a covalent bond, O, S, SO, SO$_2$, NH, —SO$_2$NH—, —NHSO$_2$—, —CONH—, —NHCO—, —SO$_2$N(C$_1$–C$_4$alkyl)—, —N(C$_1$–C$_4$alkyl)SO$_2$—, —CON(C$_1$–C$_4$alkyl)—, —N(C$_1$–C$_4$alkyl)CO—, —CH=CH—, —CO—, —OC(O)—, —C(O)O— or N(C$_1$–C$_4$alkyl) and (CH$_2$)$_m$ is attached to the phenanthrenyl moiety;

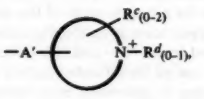


is a 5- or 6-membered monocyclic heterocycle or an 8-, 9- or 10-membered bicylic heterocycle, the heterocycle containing a first nitrogen in an aromatic 5- or 6-membered first ring, with attachment of the heterocycle to A by way of said first nitrogen and said first nitrogen is quaternary by virtue of the attachment

and ring bonds, with the first ring containing 0 or 1 of either O or S, with the first ring containing 0 to 3 additional nitrogen atoms, with the first ring optionally fused to a 3- or 4-membered moiety to form the optional second ring, with the the moiety containing at least one carbon atom, with the moiety containing 0 or 1 of either O or S, with the moiety containing 0 to 2 nitrogen atoms, and with the moiety being saturated or unsaturated and the second ring aromatic or non-aromatic;

R^c is R^a as defined under II below, hydrogen, or —N-R^YR^Z (where R^Y and R^Z are defined in II below), but independently selected from R^a and from each other if more than one R^c is present, and is attached to a carbon ring atom or a nitrogen heteroatom the valency of which is not satisfied by the ring bonds;

(b)



where

is a 5- or 6-membered monocyclic heterocycle or an 8-, 9- or 10-membered bicyclic heterocycle, the heterocycle containing a

first nitrogen in an aromatic 5- or 6-membered first ring, with said first nitrogen quaternary by virtue of a substituent R^d in addition to the ring bonds thereto, with said first nitrogen neutral in the absence of a substituent Rd, with attachment of the heterocycle to A′ by way of a carbon atom of a ring, with the first ring containing 0 or 1 of either O or S, with the first ring containing 0 to 2 additional nitrogen atoms, with the first ring optionally fused to a 3- or 4-membered moiety to form the optional second ring, with the moiety containing at least one carbon atom, with the moiety containing 0 or 1 of either O or S, with the moiety containing 0 to 2 nitrogen atoms, and with the moiety being saturated or unsaturated and the second ring aromatic or non-aromatic;

R^c is defined above;

R^d is hydrogen, NH_2, O^- or C_1–C_4alkyl (where the alkyl group is optionally mono-substituted with R^q as defined under IIc below);

A′ is $(CH_2)_m$—Q—$(CH_2)_n$, where m is 0 to 6 and n is 0 to 6, Q is given above, and when m and n are 0 then Q is not a covalent bond;

(c) —A_p—$N^+R^y(R^w)_{(0-1)}(R^z)$ where

R^y and R^z are as defined under II below,

R^y and R^z may further be together a C_2–C_4 alkylidene radical to form a ring (optionally mono-substituted with R^q as defined below) interrupted by N(O)R^e or $N^+(R^e)_2$ (where R^e is hydrogen, C_1–C_4alkyl, or C_1–C_4alkyl substituted with R^q defined below),

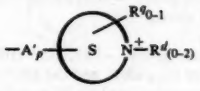
R^w is hydrogen, C_{1-4} alkyl, O^-, NH_2 or absent in which case the N^+ is neutral,

R^w, R^y and R^z may further together form a C_5–C_{10} tertiary alkylidene radical which with N^+ forms a bicyclic ring, where the tertiary alkylidene radical is optionally mono-substituted with R^q as defined below and where the tertiary carbon of the tertiary alkylidene radical is optionally replaced with nitrogen, N^+R^e (where R^e is defined above), or N^+—O^-,

p is 0 or 1, and

A is as defined above;

(d)



where

is a 5- or 6-membered monocyclic heterocycle or an 8-, 9- or 10-membered bicyclic heterocycle, the heterocycle containing a

first nitrogen in a first ring, with the first ring saturated or unsaturated and non-aromatic, with the first nitrogen quaternary by virtue of one or two substituents R^d in addition to the ring bonds thereto, with the first nitrogen alternatively neutral by virtue of zero or one substituents R^d in addition to the ring bonds thereto, with attachment of the heterocycle to A′ by way of a carbon atom or non-quaternary nitrogen atom of a ring, with the first ring containing in addition to carbon and the first nitrogen 0 to 1 of a member selected from the group consisting of the non-quaternary nitrogen of attachment, O, S, S(O), $S(O)_2$ and NR^e where R^e is defined above, with the first ring optionally fused to a 2-, 3- or 4-membered moiety to form the optional second ring, with the moiety optionally containing in addition to carbon the non-quaternary nitrogen of attachment, and with the moiety saturated or unsaturated and the second ring non-aromatic;

R^d is defined above and where more than one R^d is present on a nitrogen, at least one R^d is hydrogen or C_1–C_4alkyl;

A′ is defined above; and

p is defined above;

R^q is defined below;

II.

(a) a trifluoromethyl group: —CF_3;

(b) a halogen atom: —Br, —Cl, —F, or —I;

(c) C_1–C_4 alkoxy radical: —OC_{1-4} alkyl, wherein the alkyl is optionally mono-substituted by R^q, where

R^q is a member selected from the group consisting of —OH, —OCH_3, —CN, —C(O)NH_2, —OC(O)NH_2, CHO, —OC(O)N$(CH_3)_2$, —SO_2NH_2, —$SO_2N(CH_3)_2$, —$SOCH_3$, —SO_2CH_3, —F, —CF_3, —$COOM^a$ (where M^a is hydrogen, alkali metal, methyl or phenyl), tetrazolyl (where the point of attachment is the carbon atom of the tetrazole ring and one of the nitrogen atoms is mono-substituted by M^a as defined above) and —SO_3M^b (where M^b is hydrogen or an alkali metal);

(d) a hydroxy group: —OH;

(e) a carbonyloxy radical: —O(C═O)R^z, where

R^z is C_{1-4} alkyl or phenyl, each of which is optionally mono-substituted by R^q as defined above;

(f) a carbamoyloxy radical: —O(C═O)N(R^y)R^z where

R^y and R^z are independently H, C_{1-4} alkyl (optionally mono-substituted by R^q as defined above), together a 3- to 5-membered alkylidene radical to form a ring (optionally substituted with R^q as defined above) or together a 2- to 4-membered alkylidene radical, interrupted by —O—, —S—, —S(O)— or —$S(O)_2$—, to

form a ring (where the ring is optionally mono-substituted with Rq as defined above);
(g) a sulfur radical: —$S(O)_n$—R^s where n=0–2, and R^s is defined above;
(h) a sulfamoyl group: —$SO_2N(R^y)R^z$ where R^y and R^z are as defined above;
(i) azido: N_3
(j) a formamido group: —$N(R^t)(C{=}O)H$, where R^t is is H or C_{1-4} alkyl, and the alkyl thereof is optionally mono-substituted by R^q as defined above;
(k) a (C_1–C_4 alkyl)carbonylamino radical: —$N(R^t)(C{=}O)C_{1-4}$ alkyl, where R^t is as defined above, and the alkyl group is also optionally mono-substituted by R^q as defined above;
(l) a (C_1–C_4 alkoxy) carbonylamino radical: —$N(R^t)(C{=}O)OC_{1-4}$ alkyl, where R^t is as defined above, and the alkyl group is also optionally mono-substituted by R^q as defined above;
(m) a ureido group: —$N(R^t)(C{=}O)N(R^y)R^z$ where R^t, R^y and R^z are as defined above;
(n) a sulfonamido group: —$N(R^t)SO_2R^s$, where R^s and R^t are as defined above;
(o) a cyano group: —CN;
(p) a formyl or acetalized formyl radical: —(C=O)H or $—CH(OCH_3)_2$;
(q) (C_1–C_4 alkyl)carbonyl radical wherein the carbonyl is acetalized: $—C(OCH_3)_2C_{1-4}$ alkyl, where the alkyl is optionally mono-substituted by R^q as defined above;
(r) carbonyl radical: —$(C{=}O)R^s$, where R^s is as defined above;
(s) a hydroximinomethyl radical in which the oxygen or carbon atom is optionally substituted by a C_1–C_4 alkyl group: —$(C{=}NOR^z)R^y$ where R^y and R^z are as defined above, except they may not be joined together to form a ring;
(t) a (C_1–C_4 alkoxy)carbonyl radical: —$(C{=}O)OC_{1-4}$ alkyl, where the alkyl is optionally mono-substituted by R^q as defined above;
(u) a carbamoyl radical: —$(C{=}O)N(R^y)R^z$ where R^y and R^z are as defined above;
(v) an N-hydroxycarbamoyl or N(C_1–C_4 alkoxy)carbamoyl radical in which the nitrogen atom may be additionally substituted by a C_1–C_4 alkyl group: —$(C{=}O)$—$N(OR^y)R^z$ where R^y and R^z are as defined above, except they may not be joined together to form a ring;
(w) a thiocarbamoyl group: —$(C{=}S)N(R^y)(R^z)$ where R^y and R^z are as defined above;
(x) carboxyl: —$COOM^b$, where M^b is as defined above;
(y) thiocyanate: —SCN;
(z) trifluoromethylthio: —SCF_3;
(aa) tetrazolyl, where the point of attachment is the carbon atom of the tetrazole ring and one of the nitrogen atoms is mono-substituted by hydrogen, an alkali metal or a C_1–C_4 alkyl optionally substituted by R^q as defined above;
(ab) an anionic function selected from the group consisting of: phosphono [$P{=}O(OM^b)_2$]; alkylphosphono {$P{=}O(OM^b)$-[$O(C_1$–C_4 alkyl)]}; alkylphosphinyl [$P{=}O$-(OM^b)-(C_1–C_4alkyl)]; phosphoramido [$P{=}O(OM^b)N(R^y)R^z$ and $P{=}O(OM^b)NHR^z$]; sulfino (SO_2M^b); sulfo (SO_3M^b); acylsulfonamides selected from the structures $CONM^bSO_2R^z$, $CONM^bSO_2N(R^y)R^z$, $SO_2MN^bCON(R^y)R^z$; and SO_2NM^bCN, where
R^z is phenyl or heteroaryl, where heteroaryl is a monocyclic aromatic hydrocarbon group having 5 or 6 ring atoms, in which a carbon atom is the point of attachment, in which one of the carbon atoms has been replaced by a nitrogen atom, in which one additional carbon atom is optionally replaced by a heteroatom selected from O or S, and in which from 1 to 2 additional carbon atoms are optionally replaced by a nitrogen heteroatom, and where the phenyl and heteroaryl are optionally mono-substituted by R^q, as defined above; M^b is as defined above; and R^y and R^z are as defined above;
(ac) C_5–C_7 cycloalkyl group in which one of the carbon atoms in the ring is replaced by a heteroatom selected from O, S, NH or N(C_1–C_4 alkyl) and in which one additional carbon atom may be replaced by NH or N(C_1–C_4 alkyl), and in which at least one carbon atom adjacent to each nitrogen heteroatom has both of its attached hydrogen atoms replaced by one oxygen thus forming a carbonyl moiety and there are one or two carbonyl moieties present in the ring;
(ad) C_2–C_4 alkenyl radical, optionally mono-substituted by one of the substituents (a) to (ac) above and phenyl which is optionally substituted by R^q as defined above;
(ae) C_2–C_4 alkynyl radical, optionally mono-substituted by one of the substituents (a) to (ac) above;
(af) C_1–C_4 alkyl radical;
(ag) C_1–C_4 alkyl mono-substituted by one of the substituents (a)–(ac) above;
(ah) a 2-oxazolidinonyl moiety in which the point of attachment is the nitrogen atom of the oxazolidinone ring, the ring oxygen atom is optionally replaced by a heteroatom selected from —S— and NR^t (where R^t is as defined above) and one of the saturated carbon atoms of the oxazolidinone ring is optionally mono-substituted by one of the substituents (a) to (ag) above;
M is selected from:
(i) hydrogen;
(ii) a pharmaceutically acceptable esterifying group or removable carboxyl protecting group;
(iii) an alkali metal or other pharmaceutically acceptable cation; or
(iv) a negative charge which is balanced by a positively charged group.

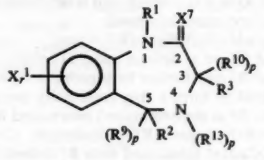
5,004,741

METHODS OF ANTAGONIZING CCK OR GASTRIN WITH BENZODIAZEPINE ANALOGS

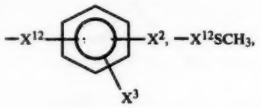
Ben E. Evans, Lansdale; Mark G. Bock, and Roger M. Freidinger, both of Hatfield, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 26,420, Mar. 16, 1987, Pat. No. 4,820,834, which is a continuation-in-part of Ser. No. 741,972, Jun. 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 705,272, Feb. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 624,854, Jun. 26, 1984, abandoned. This application Nov. 9, 1988, Ser. No. 269,212
Int. Cl.[5] A61K *31/55*
U.S. Cl. 514—221 **15 Claims**

1. A method of antagonizing the binding of cholecystokinins to cholecystokinin receptors or antagonizing the binding of gastrin to gastrin receptors which comprises contacting said cholecystokinin receptors or said gastrin receptors, respectively, with a compound represented by the formula:



wherein
R^1 is H, C_1–C_6 linear or branched alkyl, loweralkenyl, lower alkynyl, —$X^{12}COOR^6$, —X^{11}-cycloloweralkyl, —$X^{12}NR^4R^5$, $X^{12}CONR^4R^5$, —$X^{12}CN$, or —$X^{11}CX_3^{10}$;
R^2 is H, loweralkyl, substituted or unsubstituted phenyl (wherein the substituents may be 1 or 2 or halo, loweralkyl, loweralkoxy, loweralkylthio, carboxyl, carboxyloweralkyl, nitro, —CF_3, or hydroxy), 2-, 3-, 4-pyridyl



$-X^{12}SCH_3$,

$-X^{12}SOCH_3$, $-X^{12}SO_2CH_3$, or $-X^{12}COOR^6$;

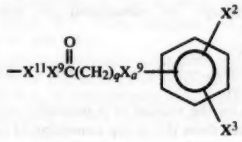
R^3 is $-X^{11}NR^{18}(CH_2)_qR^{16}$,

$-X^{11}NR^{18}\overset{O}{\overset{\|}{C}}(X^{11})_qR^7$, $-X^{11}C\overset{O}{\overset{\|}{X}}{}^9X^{11}R^7$

$NH(CH_2)_{2-3}NHR^7$, $-NH(CH_2)_{2-3}NHCOR^7$,

$-X^{11}X^9CCHCH_2R^7$, (NHCOOR^{14}),

$-X^{11}X^9CX_a^9(X^{11})_nR^7$, $-X^{11}X^9C(NH_2)-CH-CH_2R^7$,



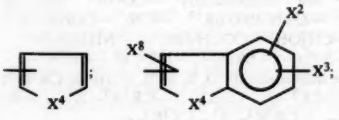
$-X^{11}NR^{18}SO_2(CH_2)_qR^7$ or

$X^{11}\overset{O}{\overset{\|}{C}}R^7$, with the proviso that R^{10} is not H or $-CH_3$ when R^3 is $X^{11}\overset{O}{\overset{\|}{C}}R^7$;

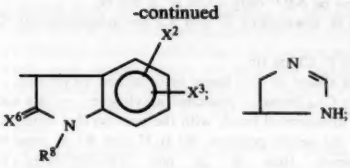
R^4 and R^5 are independently R^6 or in combination with the N of the NR^4R^5 group form an unsubstituted or mono or disubstituted, saturated or unsaturated, 4–7 membered heterocyclic ring or benzofused 4–7 membered heterocyclic ring, wherein said heterocyclic ring or said benzofused heterocyclic ring may contain a second heteroatom selected from O and NCH_3 and the substituent(s) is/are independently selected from C_{1-4} alkyl;

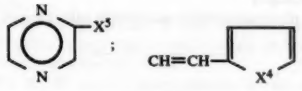
R^6 is H, loweralkyl, cycloloweralkyl, substituted or unsubstituted phenyl, or substituted or unsubstituted phenylloweralkyl wherein the phenyl or phenyloweralkyl substituents may be 1 or 2 of halo, loweralkyl, loweralkoxy, nitro, or CF_3;

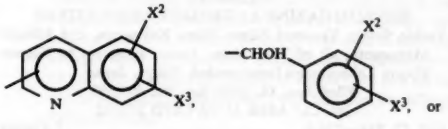
R^7 is α- or β-naphthyl, substituted or unsubstituted phenyl (wherein the substituents may be 1 or 2 of halo, $-NO_2$— —OH, $-X^{11}NR^4R^5$, loweralkyl, CF_3, CN, SCF_3, C≡CH, CH_2SCF_3, O $OCCH_3$, $OCHF_2$, SH, SPh, PO_3H, loweralkoxy, or loweralkylthio, COOH); 2-, 3-, 4-pyridyl,

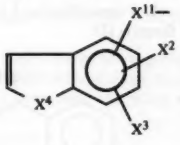


-continued

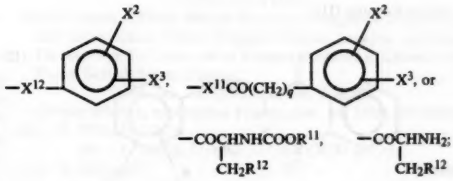








$R^8$is H, loweralkyl, cycloloweralkyl, $-X^{12}CONH_2$, $-X^{12}COOR^6$, $-X^{12}$-cycloloweralkyl, $-X^{12}NR^4R^5$,



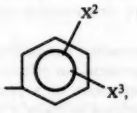
R^9 and R^{10} are independently H, —OH, or $—CH_3$;

R^{11} and R^{12} are independently loweralkyl or cycloloweralkyl;

R^{13} is H, loweralkyl, acyl, O, or cycloloweralkyl;

R^{14} is loweralkyl or phenylloweralkyl;

R^{15} is H, loweralkyl,



R^{16} is alpha and beta napthyl or 2-indolyl;

R^{18} is H, or loweralkyl;

p is 0 when its adjacent - - - is unsaturated and 1 when its adjacent - - - is saturated except that when R^{13} is 0, p=1 and is unsaturated;

q is 0–4;

r is 1 or 2;

X^1 is H, $—NO_2$, CF_3, CN, OH, loweralkyl, halo, loweralkylthio, loweralkoxy, $-X^{11}COOR^6$, or $-X^{11}NR^4R^5$;

X^2 and X^3 are independently H, —OH, $—NO_2$, halo, loweralkylthio, loweralkyl, or loweralkoxy;

X^4 is S, O, CH_2, or NR^8;

X^5 is H, CF_3, CN, $—COOR^6$, NO_2, or halo;

X^6 is O or HH; X^7 is O, S, HH, or NR^{15} with the proviso that

X^7 can be NR^{15} only when R^1 is not H;
X^8 is H, loweralkyl; X^9 and X_d^9 are independently NR^{18} or O;
X^{10} is F, Cl, or Br;
X^{11} is absent or C_{1-4} linear or branched alkylidene;
X^{12} is C_{1-4} linear or branched alkylidene; - - - is a saturated or unsaturated bond; with the proviso that when X^1 is Cl in the seven position, R^1 is H and R^2 is unsubstituted phenyl, then R^3 is not $NHCO(CH_2)_2C_6H_5$ or $NHCOC_6H_5$
and the pharmaceutically acceptable salts thereof.

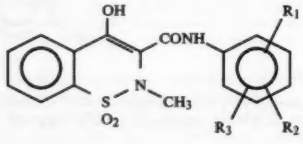
5,004,742

BENZOTHIAZINE-1,1-DIOXIDE DERIVATIVES

Toshio Satoh; Yasunori Niiro; Hisao Kakegawa, and Hitoshi Matsumoto, all of Tokushima, Japan, assignors to Nippon Hypox Laboratories Incorporated, Tokyo, Japan

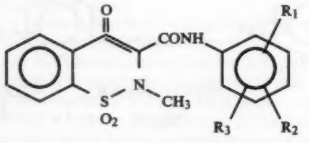
Filed Aug. 14, 1989, Ser. No. 392,899
Int. Cl.[5] A61K *31/54*; C07D *279/02*
U.S. Cl. 514—226.5 **6 Claims**

1. A benzothiazine-1,1-dioxide derivative represented by the formula (I):



(I)

or the formula (II):



(II)

[in the formulas (I) and (II), R_1 is a carboxyl group or a tetrazoyl group, and R_2 and R_3, which can be the same or different, are each an atom or substituent selected from the group consisting of a hydrogen atom, a halogen atom, a hydroxyl group, a nitro group, a cyano group, a trifluoromethyl group, a mercapto group, a lower alkyl group, a lower alkoxy group, a lower alkylcarbonyl group, a lower alkylcarbonyloxy group and a lower tioalkoxy group], or a pharmacologically acceptable salt thereof.

3. A pharmaceutical composition comprising, as the active hyaluronidase-inhibiting ingredient, an effective amount of a benzothiazine-1,1-dioxide derivative or a pharmacologically acceptable salt thereof as defined in claim **1** together with a pharmaceutically acceptable carrier or diluent.

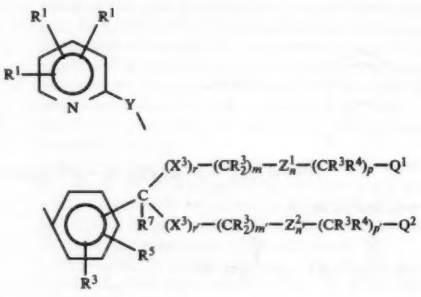
5,004,743

PYRIDYL STYRENE DIALKANOIC ACIDS AS ANTI-LEUKOTRIENE AGENTS

Robert N. Young, Senneville; Robert Zamboni, Longueuil, and Jacques Y. Gauthier, Laval, all of Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada

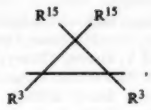
Filed Nov. 25, 1987, Ser. No. 125,637
Int. Cl.[5] C07D *211/72, 211/70, 211/68, 279/10*
U.S. Cl. 514—227.8 **10 Claims**

1. A compound of the formula:

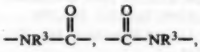


I

wherein:
R^1 is H, halogen, C_1–C_8 alkyl, C_2–C_8 alkenyl, C_2–C_8 alkynyl, $—CF_3$, $—SR^2$, $—S(O)R^2$, $—S(O)_2R^2$, $—NR^3R^3$, $—OR^3$, $—COOR^3$, $—(C═O)R^3$, $—C(OH)R^3R^3$, —CN, $—NO_2$, $—N_3$, substituted or unsubstituted phenyl, substituted or unsubstituted benzyl, substituted or unsubstituted 2-phenethyl, or substituted or unsubstituted pyridyl;
R^2 is C_1–C_8 alkyl, C_2–C_8 alkenyl, C_2–C_8 alkynyl, $—CF_3$, substituted or unsubstituted phenyl substituted or unsubstituted benzyl, or substituted or unsubstituted 2-phenethyl;
R^3 is H or R^2;
R^4 is H, halogen, $—NO_2$, —CN, $—OR^3$, $—SR^3$, NR^3R^3, or C_1–C_8 alkyl;
CR^3R^4 may be the radical of a naturally occurring amino acid selected from the group consisting of alanine, asparagine, aspartic acid, arginine, cysteine, glutamic acid, glutamine, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine and valine;
R^5 is H, halogen, $—NO_2$, $—N_3$, —CN, $—SR^2$, $—NR^3R^3$, $—OR^3$, C_1–C_8 alkyl, or $—(C═O)R^3$;
R^6 is $—CH_2CONR^{12}R^{12}$;
R^7 is H or C_1–C_4 alkyl;
R^{10} is $—SR^{11}$, $—OR^{12}$, or $—NR^{12}R^{12}$;
R^{11} is C_1–C_6 alkyl, $—(C═O)R^{14}$, unsubstituted phenyl, or unsubstituted benzyl;
R^{12} is H, R^{11}, or two R^{12} groups joined to the same N may form pyrrolidine, piperidine, morpholine, thiamorpholine, piperazine, or N-methylpiperazine;
R^{13} is C_1–C_8 alkyl, C_2–C_8 alkenyl, C_2–C_8 alkynyl, $—CF_3$, or unsubstituted phenyl, benzyl, or 2-phenethyl;
R^{14} is H or R^{13};
R^{15} is R^3 or halogen;
R^{16} is H, C_1–C_4 alkyl, or OH;
m and m' are independently 0–8;
n and n' are independently 0 or 1;
p and p' are independently 0–8;
m+n+p is 1–10 when X^2 is O, S, S(O), or $S(O)_2$;
m+n+p is 0–10 when X^2 is CR^3R^{16};
m'+n'+p' is 1–10 when X^3 is O, S, S(O), or $S(O)_2$;
m'+n'+p' is 0–10 when X^3 is CR^3R^{16};
r is 0 or 1 when Z^1 is HET ($—R^3$, $—R^5$);
r is 1 when Z^1 is $—CONR^3$;
r' is 0 or 1 when Z^2 is HET($—R^3$,$—R^5$);
r' is 1 when Z^2 is $CONR^3$;
s is 0–3;
Q^1 and Q^2 are independently $—COOR^3$, tetrazole, $—COOR^6$, $—CONHS(O)_2R^{13}$, —CN, $—CONR^{12}R^{12}$, —CHO, $—CH_2OH$, $—COCH_2OH$, or $—NHS(O)_2R^{13}$;
X^1 is O, S, $—S(O)—$, $—S(O)_2—$, $—NR^3$, or $—CR^3R^3—$;
X^2 and X^3 are independently O, S, S(O), $S(O)_2$, or CR^3R^{16};
Y is $—CR^3═CR^3—$, $—C═C—$, $—CR^3R^3—X^1—$, $—X^1—CR^3R^3—$, $—CR^3R^3—X^1—CR^3R^3—$,



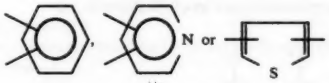
C=O,



O, S, or NR^3;

Z^1 and Z^2 are independently —$CONR^3$— or —HET(—R^3-,—R^5)—;

HET is



substituted phenyl, benzyl, 2-phenethyl, or pyridyl means 1 or 2 substituents on the aromatic ring selected from C_1–C_6 alkyl, R^{10}, NO_2, halogen, —COR^7, —COR^{10}, SCF_3, CN, and CF_3;

and the pharmaceutically acceptable salts thereof.

6. A method of preventing the synthesis, the action, or the release of SRS-A or leukotrienes in a mammal which comprises administering to said mammal an effective amount of a compound of claim 1.

5,004,744
PYRIDAZINONES AS PESTICIDES

Joachim Weissmüller, Monheim; Klaus-Günther Tietjen, Langenfeld; Wilhelm Stendel, Wuppertal, and Ulrike Wachendorff-Neumann, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

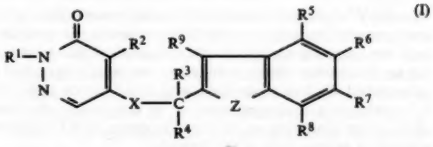
Filed Nov. 22, 1989, Ser. No. 440,544

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1988, 3841850; Jul. 18, 1989, 3923659

Int. Cl.[5] **A01N** *43/58;* **C07D** *401/00, 237/00*

U.S. Cl. 514—247 **7 Claims**

1. A substituted pyridazinone of the formula



(I)

in which

R^1 represents straight-chain or branched alkyl having 1 to 8 carbon atoms; or represents straight-chain or branched halogenoalkyl having 1 to 6 carbon atoms and 1 to 13 identical or different halogen atoms, or represents cycloalkyl which has 3 to 7 carbon atoms or cycloalkylalkyl which has 3 to 7 carbon atoms in the cycloalkyl moiety and 1 to 4 carbon atoms in the straight-chain or branched alkyl moiety, each of which is optionally substituted on the cycloalkyl moiety by at least one substituent selected from the group consisting of alkyl having 1 to 4 carbon atoms and halogen; or represents aralkyl which has 6 to 10 carbon atoms in the aryl moiety and 1 to 4 carbon atoms in the straight-chain or branched alkyl moiety and which is optionally substituted on the aryl by at least one radical selected from the group consisting of halogen, cyano, nitro, in each case straight-chain or branched alkyl, alkoxy or alkylthio, each of which has 1 to 4 carbon atoms, or in each case straight-chain or branched halogenoalkyl, halogenoalkoxy or halogenoalkylthio, each of which has 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms,

R^2 represents fluorine, chlorine, bromine or iodine, or represents straight-chain or branched alkyl having 1 to 4 carbon atoms,

R^3 and R^4 independently of one another each represents hydrogen, or represents straight-chain or branched alkyl having 1 to 4 carbon atoms,

R^5, R^6, R^7, R^8 and R^9 independently of one another each represents hydrogen or halogen or represent in each case straight-chain or branched alkyl, alkoxy or alkylthio, each of which has 1 to 4 carbon atoms, or represent in each case straight-chain or branched halogenoalkyl, halogenoalkoxy or halogenoalkylthio, each of which has 1 to 4 carbon atoms and each of which has 1 to 9 identical or different halogen atoms,

X represents oxygen or sulphur and

Z represents a radical of the formula —CH=CH—, —CH_2—O—, —O— or —S—.

7. A method of combating pests which comprises applying thereto or to a habitat from which it is desired to exclude them a pesticidally effective amount of a compound according to claim 1.

5,004,745
BENZO[1,8]NAPHTHYRIDINE DERIVATIVES, THEIR PREPARATION AND THE COMPOSITIONS WHICH CONTAIN THEM

Michel Antoine, Paris; Michel Barreau, Montgeron; Jean-Francois Desconclois, Paris; Philippe Girard, Arpajon, and Guy Picaut, Chevilly Larue, all of France, assignors to Laboratoire Roger Bellon, Seine, France

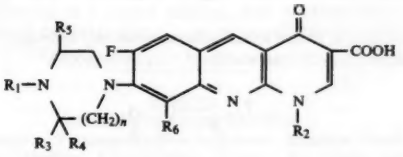
Filed Jan. 16, 1990, Ser. No. 465,483

Claims priority, application France, Jan. 16, 1989, 89 00430; Jul. 28, 1989, 89 10218

Int. Cl.[5] **A61K** *31/495, 31/395;* **C07D** *401/14*

U.S. Cl. 514—254 **8 Claims**

1. A benzo(b)(1,8)naphthyridine compound, comprising the formula:



wherein,

R_1 represents a hydrogen atom or an alkyl or hydroxyalkyl radical,

R_2 represents a hydrogen atom or an alkyl, fluoroalkyl, cycloalkyl, alkoxy or alkylamino radical,

R_3 represents an alkyl radical, and

R_4 and R_5 are different and represent a hydrogen atom or an alkyl radical, or

R_3 represents a hydrogenation or an alkyl or cycloalkyl radical and

R_4 and R_5 are hydrogen atoms,

R_6 represents a hydrogen or fluorine atom and n is equal to 1 or 2,

the alkyl radicals containing 1 to 4 carbon atoms in a straight or branched chain and the cycloalkyl radicals containing 3 to 6 carbon atoms, or a pharmaceutically acceptable metal salt thereof, its addition salts with nitrogenous bases or its acid

addition salts as well as its hydrated forms and, where appropriate, its isomers and their mixtures.

8. A pharmaceutical composition comprising an effective amount of at least one compound according to claim 1, in the pure form or in combination with one or more compatible diluents or adjuvants.

5,004,746

ANTI-RETROVIRAL CASTANOSPERMINE ESTERS

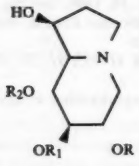
Paul S. Liu; Sai P. Sunkara, both of Cincinnati, and Terry L. Bowlin, Maineville, all of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Sep. 29, 1987, Ser. No. 102,070

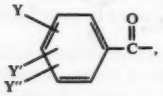
Int. Cl.[5] A61K *31/44*

U.S. Cl. 514—299 28 Claims

1. A method of treating a retroviral infection in a patient in need thereof which comprises administering to the patient an anti-retrovirally effective amount of a castanospermine ester of the formula:



wherein R, R_1 and R_2 are each independently hydrogen, C_{1-10} alkanoyl, cyclohexanecarbonyl, C_{1-6} alkoxyacetyl,



naphthalenecarbonyl optionally substituted by methyl or halogen; phenyl(C_{2-6} alkanoyl) wherein the phenyl is optionally substituted by methyl or halogen; cinnamoyl; pyridinecarbonyl optionally substituted by methyl or halogen; dihydropyridine carbonyl optionally substituted by C_1-C_{10} alkyl; thiophenecarbonyl optionally substituted by methyl or halogen; or furancarbonyl optionally substituted by methyl or halogen;

Y is hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy, halogen, trifluoromethyl, C_{1-4} alkylsulfonyl, C_{1-4} alkylmercapto, cyano or dimethylamino; Y' is hydrogen C_{1-4} alkyl C_{1-4} alkoxy, halogen or it is combined with Y to give 3,4-methylenedioxy; Y'' is hydrogen, C_{104} alkyl, C_{1-4} alkoxy or halogen; with R, R_1 and R_2 being selected in such a way that at least one of them, but not more than two of them, is hydrogen; or a pharmaceutically acceptable salt thereof.

5,004,747

ISOQUINOLINONES

Michael J. Ashton; Andrew W. Bridge, both of Chelmsford; Robert K. Chambers, Little Waltham; Donald I. Dron, Upminster; Garry Fenton, Brentwood; Neil V. Harris, Tilbury; David J. Lythgoe, Gidea Park; Ian M. McFarlane, Dagenham; Christopher G. Newton, Chelmsford; David Riddell, Billericay; Christopher Smith, Benfleet; Keith A. J. Stuttle, Rochford, and Malcolm P. Toft, Romford, all of England, assignors to May & Baker Limited, Dagenham, England

Continuation of Ser. No. 302,389, Jan. 26, 1989, abandoned. This application Mar. 15, 1990, Ser. No. 494,956

Claims priority, application United Kingdom, Jan. 27, 1988, 8801772; Aug. 12, 1988, 8819221

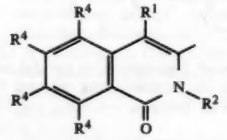
Int. Cl.[5] A61K *31/47*; C07D *405/06*

U.S. Cl. 514—309 17 Claims

1. An isoquinolinone derivative of the formula:

$$A—X—R^3 \quad (I)$$

wherein A represents a group of the formula:

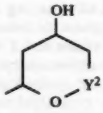


(II)

wherein R^1 and R^2, which may be the same or different, each represents a cycloalkyl group containing from 3 to 8 carbon atoms, or represents a straight- or branched-chain alkyl, alkenyl or alkynyl group containing up to 6 carbon atoms, which may be substituted by up to 3 halogen atoms or by a cycloalkyl group containing from 3 to 8 carbon atoms, or represents an optionally substituted aryl or heteroaryl group, and the symbols R^4 may be the same or different and each represents a hydrogen or halogen atom or represents an optionally substituted straight- or branched-chain alkyl, alkenyl or alkynyl group containing up to 6 carbon atoms, or an optionally substituted aryl or heteroaryl group or a group of the formula R^6O— wherein R^6 represents a straight- or branched-chain alkyl group containing up to 6 carbon atoms, an aryl or an arylalkyl group containing 1 or 2 carbon atoms in the alkyl moiety, X represents an ethylene or vinylene group, R^3 represents a group of the formula:

$$—Y^1—CH_2—CH(OH)—CH_2—COOR^5 \quad (III)$$

wherein Y^1 represents a carbonyl or hydroxymethylene group or a group of the formula $—C(OR)_2—$ wherein the symbols R each represent a branched or unbranched alkyl group containing up to 6 carbon atoms or together represent a branched or unbranched alkylene chain containing 2 to 5 carbon atoms and R^5 represents a hydrogen atom or an optionally substituted alkyl group containing up to 6 carbon atoms, or R^3 represents a lactol or lactone ring of the formula:



(IV)

wherein Y^2 represents a carbonyl or hydroxymethylene group, or a pharmaceutically acceptable salt thereof when R^5 represents a hydrogen atom.

17. A pharmaceutical composition useful in the treatment of hypercholesterolaemic and hyperlipoproteinaemic states, of atherosclerosis and associated conditions and of fungal infections which comprises, as active ingredient, an effective

amount of an isoquinolinone derivative of general formula I as defined in claim 1, or a pharmaceutically acceptable salt thereof, in association with a pharmaceutically acceptable carrier or coating.

5,004,748

SUBSTITUTED PYRIDINE-2,4-DICARBOXYLIC ACID DERIVATIVES AND MEDICAMENTS BASED ON THESE COMPOUNDS

Ekkehard Baader, Taunus; Martin Bickel, Bad Homburg; Dietrich Brocks, Wiesbaden; Volkmar Günzler, Marburg-Cappel; Stephan Henke, Bad Soden am Taunus, and Hartmut Hanauske-Abel, Dexheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

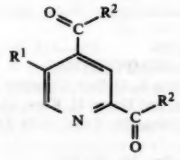
Filed Mar. 4, 1988, Ser. No. 164,406

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1987, 3707429

Int. Cl.[5] A61K *31/44;* **C07D** *213/79*

U.S. Cl. 514—350 **6 Claims**

1. A substituted pyridine-2,4-dicarboxylic acid derivative of the formula I



(I)

in which:

R^1 is a substituent of the formula $—OR^3$, or $—N(R^3)_2$, in which R^3 is hydrogen or C_1–C_9-alkyl, C_1–C_9-alkenyl, C_1–C_9-alkynyl or C_1–C_9-alkylcarbonyl, the radicals thereof being optionally mono- or disubstituted by halogen, hydroxyl, nitro, cyano, amino, C_1–C_4-alkoxy, carboxyl, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkylcarbonyloxy or C_1–C_4-alkyl-or C_1–C_4-dialkyl-amino, or optionally substituted by phenyl, naphthyl, thienyl, furyl, pyrrolyl or pyridyl, the aryl or heteroaryl radicals being optionally monosubstituted by halogen, carboxyl, amino, C_1–C_4-alkyl- or C_1–C_4-dialkylamino or hydroxyl, and the two substituents R^3 in $—N(R^3)_2$ being the same or different, and

R^2 denotes a substituent of the formula $—OR^4$ in which R^4 denotes hydrogen or C_1–C_{12}-alkyl, which is optionally mono- or disubstituted by halogen, hydroxyl, cyano, carboxyl, C_1–C_4-alkoxy, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkylcarbonyloxy, or C_1–C_4-alkyl- or C_1–C_4-dialkylamino, or is optionally substituted by phenyl, which is optionally mono-, di- or trisubstituted by halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy, the substituents being the same or different in the case of polysubstitution, or

R^4 denotes cyclohexyl, which is optionally benzo-fused, or

R^4 denotes phenyl, naphthyl, thienyl, furyl, pyrrolyl or pyridyl, the phenyl, naphthyl and pyridyl radicals being optionally mono-, di- or trisubstituted and the thienyl, furyl and pyrrolyl radicals being optionally monosubstituted by halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy, the substituents being the same or different in the case of polysubstitution,

and the two radicals R^2 bonded to the pyridine skeleton via the carbonyl group in the 2- and 4- position being the same or different, and the alkyl radicals with more than 2 carbon atoms being optionally branched, or the physiologically tolerated salt, excluding 5-methoxypyridine-2,4-dicarboxylic acid-dimethyl ester.

5,004,749

CONCENTRATED AQUEOUS SOLUTION OF GLUTARALDEHYDE AND 1,2-BENZISOTHIAZOLIN-3-ONE

Russell J. Jerusik, Wilmington, Del., and Paul F. Mahon, Oldham, England, assignors to Imperial Chemical Industries plc, London, England and ICI Americas Inc., Wilmington, Del.

Filed Apr. 20, 1989, Ser. No. 340,935

Int. Cl.[5] A10N *43/80*

U.S. Cl. 514—372 **14 Claims**

1. A composition comprising 1,2-benzisothiazolin-3-one and water, which composition further comprises a buffering agent such that the pH of the composition is between about 3.0 and 7.0, and a sufficient amount of glutaraldehyde such that a greater amount of such 1,2-benzisothiazolin-3-one is in solution than would be present in solution if such glutaraldehyde were not present.

5,004,750

BENZOFURAN AND BENZOTHOIPHENE DERIVATIVES, OF TETRAZOLE AND ANTI-HYPERURICEMIA USE THEREOF

Tsuyoshi Tomiyama; Akira Tomiyama, both of Hanishina, and Koichi Kubota, Matsumoto, all of Japan, assignors to Kotobuki Seiyaku Company Limited, Nagano, Japan

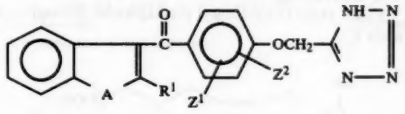
Division of Ser. No. 891,276, Jul. 28, 1986, Pat. No. 4,797,415, which is a continuation-in-part of Ser. No. 543,292, Oct. 19, 1983, abandoned. This application Dec. 6, 1988, Ser. No. 280,564

Claims priority, application Japan, Oct. 19, 1982, 57-182130

Int. Cl.[5] C07D *407/12, 409/12;* **A61K** *31/38, 31/41*

U.S. Cl. 514—382 **16 Claims**

1. A compound of the formula



wherein

A is oxygen or sulfur,

R^1 is lower alkyl and

Z^1 and Z^2 are each selected from a hydrogen atom or a lower alkyl group.

10. A method of treating hyperuricemia which comprises administering to a patient suffering from hyperuricemia a compound defined in claim 1 in an amount effective to inhibit hyperuricemia.

5,004,751

HYDANTOIN DERIVATIVES

Ei Mochida, Toshima; Kimihiro Murakami, Shizuoka; Kazuo Kato, Mishima; Katsuaki Kato, Koganei; Jun Okuda, and Ichitomo Miwa, both of Nagoya, all of Japan, assignors to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

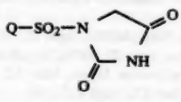
Continuation-in-part of Ser. No. 235,557, Aug. 24, 1988. This application Oct. 24, 1989, Ser. No. 426,021

Claims priority, application Japan, Aug. 28, 1987, 62-214549; Feb. 25, 1989, 1-43422

Int. Cl.[5] C07D *233/30;* **A61K** *31/415*

U.S. Cl. 514—390 **8 Claims**

1. A hydantoin derivative represented by the formula (I):



(I)

or a non-toxic salt, solvate or solvate of a non-toxic salt

thereof; wherein Q represents a furyl group, a thienyl group, a benzofuryl group or a benzothienyl group, optionally substituted by one or more substituents which are the same or different and selected from a group consisting of a halogen atom, a lower alkyl group, a nitro group, a cyano group, an optionally protected carboxy group, an optionally protected carboxymethyl group, a halogenated lower alkyl group, a lower alkylthio group, a lower alkylcarbonyl group, a lower alkoxy group, a lower alkylsulfinyl group, a lower alkylsulfonyl group, an optionally protected hydroxy group, an optionally protected amino group, a carbamoyl group and a phenyl group.

5,004,752

NOVEL 9-HALOPROSTAGLANDINS, PROCESSES FOR THEIR PREPARATION, AND THEIR USE AS MEDICINAL AGENTS

Bernd Raduechel; Werner Skuballa; Helmut Vorbrueggen; Olaf Loge, and Ekkehard Schilliner, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

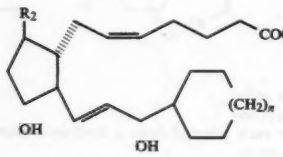
Continuation of Ser. No. 114,342, Oct. 30, 1987, abandoned, which is a continuation of Ser. No. 940,690, filed as PCT DE86/00122 on Mar. 19, 1986, abandoned. This application May 8, 1989, Ser. No. 350,951

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510978

Int. Cl.[5] **C07C** *177/00;* **A61K** *31/557*

U.S. Cl. 514—530 **12 Claims**

1. A 9-Halo-15-cycloalkyl prostaglandin derivative of Formula I



(I)

wherein

R_1 is hydrogen or methyl,

R_2 is chlorine,

n is 0 or 1, or when R_1 is hydrogen, a salt thereof with a physiologically compatible base or a cyclodextrin clathrate thereof.

5,004,753

CARBOXYLIC ACID ESTERS, METHOD FOR THEIR PRODUCTION AND INSECTICIDES CONTAINING THEM AS ACTIVE INGREDIENT

Ken Otaka, Takarazuka; Noritada Matsuo, Itami; Kazunori Tsushima, Nishinomiya, and Toshihiko Yano, Ashiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

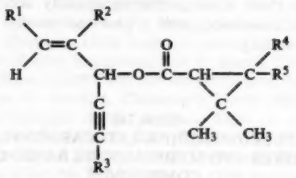
Continuation of Ser. No. 186,933, Apr. 27, 1988, abandoned. This application Apr. 20, 1990, Ser. No. 512,506

Claims priority, application Japan, May 12, 1987, 62-116219

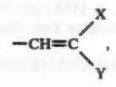
Int. Cl.[5] **A01N** *53/00*

U.S. Cl. 514—531 **6 Claims**

1. A compound represented by the formula



wherein R^1 represents halogenated C_1–C_4 alkyl, R^2 represents fluorine or methyl, R^3 represents hydrogen, R^4 represents hydrogen or methyl, and when R^4 is hydrogen, R^5 represents a group of the formula



in which X and Y are the same or different and represent methyl, fluorine, chlorine, bromine or trifluoromethyl, and when R^4 is methyl, R^5 represents methyl.

5,004,754

BIOFUNGICIDAL COMPOSITION

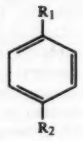
J. André Fortin, Neufchatel; Kelvin K. Ogilvie, Canning; Youla S. Tsantrizos, Ville St-Laurent, and Harry H. Kope, Quebec, all of Canada, assignors to Universite Laval, Cite Universitaire, Canada

Filed Jun. 5, 1989, Ser. No. 361,052

Int. Cl.[5] **A01N** *37/10;* **A61K** *31/19;* **C07C** *59/84, 59/50*

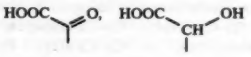
U.S. Cl. 514—570 **9 Claims**

1. A method of destroying phytopathogenic fungi which comprises administering to a plant infected with said fungi at a concentration of at least 30 μg/ml a compound of formula I:



I

wherein R_1 is selected from the group consisting of



R_2 is —H or —OH and mixtures thereof.

5,004,755

PHARMACEUTICAL USE OF LAEVOROTATORY BASIC DERIVATIVE OF 9,10-ETHANOANTHRACENE

Angelo Storni, Rheinfelden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 274,907, Jun. 18, 1981, abandoned. This application Aug. 28, 1987, Ser. No. 100,145

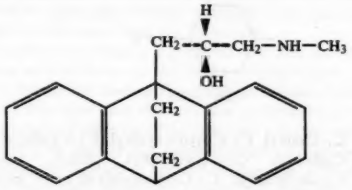
Claims priority, application Switzerland, Feb. 2, 1979, 1046/79; Jan. 8, 1980, 93/80

Int. Cl.[5] **A61K** *31/135*

U.S. Cl. 514—653 **9 Claims**

1. A method of treating a dysphoric condition characterized by anxiety, depression or excitability in a warm-blooded animal in need of such treatment comprising administering, enter-

ally or parenterally, to said animal a therapeutically effective amount for said condition of a compound of the formula



(I)

which is R-(−)-alpha-[(methylamino)methyl]-9,10-ethanoanthracene-9(10H)-ethanol, substantially free of the S-(+) antipode thereof, or a pharmaceutically acceptable salt thereof.

5,004,756

ANTI-CANCER ACTIVITY POTENTIATOR

Osamu Ogawa, Shiki; Ikuo Kishi, Ichikawa; Yoshiyuki Tahara, Tsurugashima, and Masanori Sugita, Sakado, all of Japan, assignors to Lederle (Japan) Ltd. and Nisshin Flour Milling Co., Ltd., both of Tokyo, Japan

Filed Aug. 8, 1989, Ser. No. 390,875

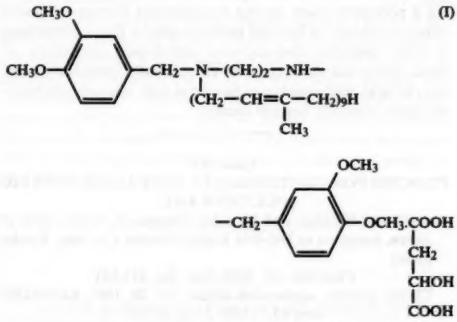
Claims priority, application Japan, Aug. 11, 1988, 198795

Int. Cl.[5] A61K *31/135*

U.S. Cl. 514—655 **8 Claims**

1. A intravenously injectable oil-in-water type micro-emulsion having an action of potentiating the activities of anti-cancer agents, said micro-emulsion comprising

fine particles of a mean diameter of not more than 1 micron of a vegetable oil or a triglyceride of a medium-chain fatty acid having 8 to 12 carbon atoms containing 0.1 to 10% (w/v) of N-solanesyl-N,N'-bis(3,4-dimethoxybenzyl)ethylenediamine malate of formula (I) below,



(I)

an aqueous medium, and

0.05 to 25% (w/v) of physiologically acceptable phospholipid for dispersing said fine particles in said aqueous medium.

5,004,757

VIRUCIDAL LOW TOXICITY COMPOSITIONS

Raymond M. G. Boucher, Houston, Tex., assignor to Wave Energy Systems, Inc., Houston, Tex.

Filed Dec. 20, 1988, Ser. No. 286,738

Int. Cl.[5] A61K *31/115, 31/11*

U.S. Cl. 514—694 **16 Claims**

1. A method of deactivating viruses on an animate or inanimate surface which comprises applying to said surface an effective amount of a virucidal liquid composition comprising:

(a) a solvent consisting of water or a lower alkanol;

(b) a saturated monoaldehyde or dialdehyde containing from 2 to about 6 carbon atoms;

(c) an anionic surfactant with a negatively-charged hydrophilic group selected from the group consisting of alkyl sulfates, alkyl sulfonates, alcohol sulfates, alkyl aryl sulfonates, dialkyl sulfosuccinates, and mixtures thereof;

(d) buffer salts in sufficient amounts to stabilize the Ph of the virucidal solutions inside the range of from about 4 to about 7.4 wherein the ratio by weight of anionic surfactant to dialdehyde is no less than about 1 to 4 and no more than about 10 to 11.

5,004,758

WATER SOLUBLE CAMPTOTHECIN ANALOGS USEFUL FOR INHIBITING THE GROWTH OF ANIMAL TUMOR CELLS

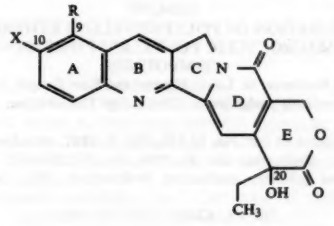
Jeffrey C. Boehm, King of Prussia, Pa.; Sidney M. Hecht, Charlottesville, Va.; Kenneth G. Holden, Malvern, Pa.; Randall K. Johnson, Ardmore, Pa., and William D. Kingsbury, Wayne, Pa., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 127,148, Dec. 1, 1987, abandoned. This application Nov. 2, 1988, Ser. No. 266,460

Int. Cl.[5] A61K *31/47*; C07D *491/22*

U.S. Cl. 514—283 **35 Claims**

1. A compound of the formula:



wherein:

X is hydroxy; hydrogen; $—CH_2NH_2$; or formyl;

R is hydrogen when X is CH_2NH_2 or formyl; or R is —CHO or $—CH_2R^1$ when X is hydrogen or hydroxy;

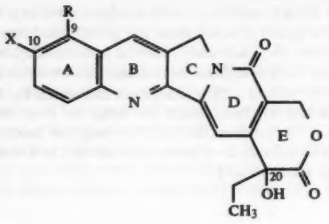
R^1 is $—O—R^2$; $—S—R^2$; $—CH_2NH_2$; cyano; $—N—R^2(R^3)$; or $—N^+—R^2(R^3)(R^4)$, provided that when R^1 is $—N^+—R^2(R^3)(R^4)$ the compound is associated with a pharmaceutically acceptable anion;

R^2, R^3 and R^4 are the same or different and are selected from H; C_{1-6} alkyl; C_{2-6} hydroxyalkyl; C_{1-6} dialkylamino-C_{2-6} alkyl; C_{1-6} alkylamino-C_{2-6} alkyl; C_{2-6} aminoalkyl or a 3–7 member unsubstituted carbocyclic ring; and

when R^1 is $—N—R^2(R^3)$, the R^2 and R^3 groups may be combined together with the nitrogen atom to which they are bonded to form a heterocyclic ring provided that such heterocyclic ring is selected from morpholino, N-methylpiperazinyl, or 4'-piperidinopiperidinyl;

or a pharmaceutically acceptable salt, hydrate or solvate thereof.

26. A method of inhibiting the growth of animal tumor cells sensitive to a compound of the formula:



wherein:

X is hydroxy; hydrogen; —CH_2NH_2; or formyl;

R is hydrogen when X is CH_2NH_2 or formyl; or R is —CHO or —CH_2R^1 when X is hydrogen or hydroxy;

R^1 is —O—R^2; —S—R^2; —CH_2NH_2; cyano; —N—$R^2(R^3)$; or —N^+—$R^2(R^3)(R^4)$, provided that when R^1 is —N^+—$R^2(R^3)(R^4)$ the compound is associated with a pharmaceutically acceptable anion;

R^2,R^3 and R^4 are the same or different and are selected from H; C_{1-6} alkyl C_{2-6} hydroxyalkyl; C_{1-6} dialkylamino-C_{2-6} alkyl; C_{1-6} alkylamino-C_{2-6} alkyl; C_{2-6} aminoalkyl or a 3–7 member unsubstituted carbocyclic ring; and

when R^1 is —N—$R^2(R^3)$, the R^2 and R^3 groups may be combined together with the nitrogen atom to which they are bonded to form a heterocyclic ring provided that such heterocyclic ring is selected from morpholino, N-methylpiperazinyl, or 4'-piperidinopiperidinyl;

or a pharmaceutically acceptable salt, hydrate or solvate thereof, wherein such method comprises administering to an animal afflicted with said tumor cells, an effective, tumor cell growth inhibiting amount of such compound.

5,004,759

STABILISATION OF POLYPHENYLENE ETHERS WITH MACROCYCLIC POLYALKYLPIPERIDINE COMPOUNDS

Francis Mutterer, St. Louis, France, and Kurt Berger, Allschwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

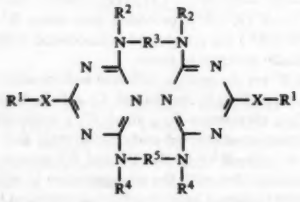
Continuation of Ser. No. 12,533, Feb. 9, 1987, abandoned. This application Jun. 28, 1988, Ser. No. 213,512

Claims priority, application Switzerland, Feb. 14, 1986, 596/86

Int. Cl.[5] C08K *5/349.2, 5/349.3*

U.S. Cl. 524—89 **6 Claims**

1. A stabilised composition comprising a polyphenylene ether with an effective light stabilizing amount of a compound of formula I

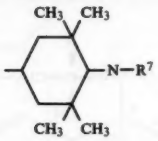


I

wherein

X is —O—, —S— or —N(R^9)—,

R^1 is hydrogen, C_1–C_{12}alkyl, C_2–C_4hydroxyalkyl, C_3–C_{12}alkoxyalkyl, C_3–C_6alkenyl, C_5–C_8cycloalkyl, phenyl, naphthyl, C_7–C_{12}alkylphenyl, C_7–C_{10}phenylalkyl or a group of formula II



II

R^2 is C_1–C_4alkyl, C_2–C_4hydroxyalkyl, C_3–C_{12}alkoxyalkyl, C_3–C_6alkenyl, C_5–C_8cycloalkyl, phenyl, naphthyl, C_7–C_{12}alkylphenyl, C_7–C_{10}phenylalkyl or a group of formula II,

R^3 is C_2–C_8alkylene, C_2–C_8azaalkylene or C_2–C_8oxaalkylene, C_6–C_8cycloalkylene, phenylene, diphenylene or xylylene,

R^4 has one of the meanings assigned to R^2,

R^5 has one of the meanings assigned to R^3,

R^6 is C_1–C_{12}alkyl, C_3–C_6alkenyl, C_2–C_4hydroxyalkyl, C_3–C_6alkoxyalkyl, C_5–C_8cycloalkyl, phenyl, naphthyl, C_7–C_{12}alkylphenyl, C_7–C_{10}phenylalkyl or a group of formula II, or R^1 and R^6, when taken together, are tetramethylene, pentamethylene or 3-oxapentamethylene, and

R^7 is hydrogen, C_1–C_4alkyl, allyl, benzyl or acetyl, with the proviso that at least one of R^1, R^2, R^4 or R^6 is a group of formula II.

5,004,760

BIOCIDAL FOAMS

Robert T. Patton; Walter L. Vaughn, both of Lake Jackson, and Thomas J. McKeand, Jr., Clute, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 16, 1990, Ser. No. 481,913

Int. Cl.[5] C08J *9/00*

U.S. Cl. 521—149 **15 Claims**

1. A foam structure having biocidal characteristics comprising a polymeric foam having incorporated therein a biocidal effective amount of biocidal particles and/or fibers comprising a water insoluble thermoplastic copolymer comprising an alpha olefin and an alpha, beta-ethylenically unsaturated carboxylic acid, said copolymer having at least one cationic biocidal agent ionically bonded thereto.

5,004,761

PROCESS FOR CONTINUOUSLY PREPARING ACRYLIC POLYMER GEL

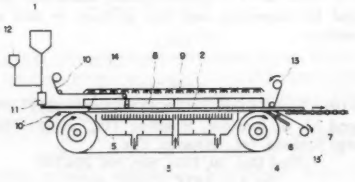
Akira Yada, Kusatsu, and Shusaku Matsumoto, Kyoto, both of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Jul. 25, 1988, Ser. No. 223,851

Claims priority, application Japan, Jul. 28, 1987, 62-188230

Int. Cl.[5] C08F *2/50, 20/56*

U.S. Cl. 522—3 **7 Claims**



1. A process for continuously preparing an acrylic polymer gel using a photopolymerization apparatus including a movable support and a gas tight chamber having a light permeable upper part which comprises:

(a) decreasing the dissolved oxygen in a monomer solution

of at least one acrylic monomer containing a photopolymerization initiator to at most 1 mg/liter,

(b) maintaining the concentration of oxygen in the gas phase inside a gas tight chamber arranged over a moving support at not more than 1% by volume,

(c) continuously feeding a synthetic resin film onto the moving support from one end of the moving support,

(d) continuously feeding the monomer solution in the form of a thin layer onto the resin film on the moving support,

(e) irradiating the layer of the monomer solution with a light energy to initiate the polymerization and to cause the monomer solution to become substantially nonflowable,

(f) continuously feeding a synthetic resin film and bringing the resin film into contact with the upper surface of the layer of the monomer solution when the monomer solution has become substantially nonflowable,

(g) continuing the polymerization by the irradiation of light energy to produce a polymer in the form of gel, and

(h) continuously peeling off the resin films on the both sides of the produced sheet-like polymer at the other end of the moving support and continuously taking out the sheet-like polymer from the moving support.

5,004,762

RADIATION CURABLE COMPOSITIONS BASED ON 4-ACETOXYSTYRENE AND 4-HYDROXYSTYRENE HOMOPOLYMERS

Balaram Gupta, North Plainfield, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.

Filed Nov. 22, 1989, Ser. No. 441,130

The portion of the term of this patent subsequent to Oct. 4, 2005, has been disclaimed.

Int. Cl.[5] **C08F** *261/12, 261/02, 112/24, 120/16*

U.S. Cl. 522—121 **6 Claims**

1. A radiation curable composition comprising a blend of (A) about 30 to about 80 weight percent of a homopolymer of 4-acetoxystyrene, a homopolymer of 4-hydroxystyrene, or mixtures thereof; (B) about 20 to about 70 weight percent of a polyethylenically unsaturated radiation polymerizable compound; and (C) about 0 to about 40 weight percent of a monoethylenically unsaturated radiation polymerizable monomer, wherein the weight percents are based on the total weight of (A), (B) and (C).

5,004,763

WATER BASE ERASABLE INK COMPOSITIONS

Kiyotaka Imagawa, Osaka, Japan, assignor to Sakura Color Products Corporation, Osaka, Japan

Continuation of Ser. No. 288,578, Dec. 22, 1988, abandoned. This application Aug. 22, 1990, Ser. No. 569,764

Claims priority, application Japan, Dec. 25, 1987, 62-331021; Nov. 15, 1988, 63-288235; Nov. 15, 1988, 63-288238

Int. Cl.[5] **C09D** *11/10*

U.S. Cl. 523—161 **10 Claims**

1. A water base erasable ink composition consisting essentially of:

(a) water as a solvent in amounts of 50–90% by weight;

(b) a pigment dispersed in water in amounts of 1–30% by weight;

(c) an aqueous emulsion of a fatty acid ester in dry amounts of 1–20% by weight; and

(d) a water-solubilized vinyl acetate-acrylic acid copolymer which is film forming at room temperatures in amounts of 0.1–15% by weight.

5,004,764

COMPOSITION FOR VIBRATION DAMPER, PROCESS FOR MANUFACTURE THEREOF, AND VIBRATION DAMPER

Yohzoh Yamamoto; Shuichi Ishiwata, both of Ichihara; Kenji Yokoyama, and Kimio Hasegawa, both of Tokyo, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd. and NEC Environment Engineering, Ltd., both of Tokyo, Japan

Filed Feb. 9, 1989, Ser. No. 308,006

Claims priority, application Japan, Feb. 12, 1988, 63-031416; Feb. 12, 1988, 63-031417; Feb. 12, 1988, 63-031418

Int. Cl.[5] **C08L** *63/04, 63/02*

U.S. Cl. 523—400 **11 Claims**

1. A composition for a vibration damper, which comprises:

100 parts by weight of a resin-forming component comprising (a) a compound containing an epoxy group and having an epoxy equivalent value of 50 to 2000,

and (b) a curing component comprising (i) a polyhydric phenol as a first curing compound and (ii) a second curing compound selected from the group consisting of an acid hydrazide and a urea derivative;

50 to 500 parts by weight of a scaly filler;

200 parts by weight or less of a powdery filler; and

100 parts by weight or less of a fibrous filler, wherein the amount of the hydroxyl group of the polyhydric phenol is 0.6 to 1.3 equivalents per equivalent of the epoxy group of the epoxy group-containing compound, and the amuont of the second curing compound incorporated is 1 to 10 parts by weight per 100 parts by weight of the epoxy group-containing compound.

5,004,765

LOW PROFILE MOLDING SYSTEM

Kenneth E. Atkins, S. Charleston; Robert R. Gentry, St. Albans, and Raymond C. Gandy, Hurricane, all of W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 175,987, Mar. 31, 1988. This application Nov. 6, 1989, Ser. No. 431,831

Int. Cl.[5] **C08K** *7/14, 7/06;* **C08L** *67/07, 67/06*

U.S. Cl. 523—434 **17 Claims**

1. A molding additive composition comprising:

(a) about 25 to 70 weight percent of a thermosetting unsaturated polyester or a vinyl ester;

(b) about 5 to about 25 weight percent of a low profile additive;

(c) about 35 to 70 weight percent of a crosslinking monomer which is olefinically unsaturated and crosslinkable with said thermosetting polyester or said vinyl ester; and

(d) about 1 to 5 weight percent of a silicon oxyalkylene copolymer flow control agent wherein the silicon oxyalkylene copolymer contains a functional group having olefinic unsaturation and is reactive with the thermosetting polyester or vinyl ester and wherein the silicon oxyalkylene copolymer has a molecular weight less than that of the low profile additive.

5,004,766

Patent Not Issued For This Number

5,004,767

POLYMER COMPOSITIONS

Frank Krause, Kleve, and Reinhard Kniewske, Fallingbostel, both of Fed. Rep. of Germany, assignors to Cerestar Holding B.V., Sas Van Gent, Netherlands

Filed Mar. 17, 1989, Ser. No. 324,828

Claims priority, application United Kingdom, Mar. 21, 1988, 8806692

Int. Cl.[5] C08L *3/02*; C08K *5/04, 5/07*

U.S. Cl. 524—30 **10 Claims**

1. An aqueous acrylate polymer dispersion which has a total solids content of 30 to 60% by weight and which has been made by polymerizing one or more acrylate monomers, optionally together with other olefinically unsaturated monomer(s), in the presence of a dextrin, said dextrin being the degradation product produced by heating a starch, with or without the addition of chemical reagents, at least 70% of said dextrin having a molecular weight in the range of 1000 to 25,000 and not more than 10% of said dextrin having a molecular weight above 25,000.

5,004,768

ADHESIVE COMPOSITIONS AND SELF-ADHESIVE SHEET MATERIALS

Mahinder S. Mahil, Thorley, and John M. Cruden, Harlow, both of England, assignors to Harlow Chemical Company Limited, Essex, England

Filed Jul. 1, 1988, Ser. No. 214,291

Claims priority, application United Kingdom, Jul. 3, 1987, 8715736

Int. Cl.[5] C08L *3/02, 5/16*

U.S. Cl. 524—30 **5 Claims**

1. A composition comprising: from 4% to 30% dextrin, from 1% to 15% of a surfactant and from 65% to 95% of a polymer having at least 75% by weight of its repeating units derived from an acrylate of at least one saturated aliphatic alcohol having from 4 to 12 carbon atoms, the percentages being by weight, based on the total weight of dextrin, surfactant and polymer, and the composition being capable of acting as a pressure-sensitive adhesive.

5,004,769

USE OF NONIONIC CELLULOSE ETHERS IN JOINT-SEALING MATERIALS AND COATING MATERIALS

Helmut Loth, Essen; Klaus Helpenstein, Moenchengladbach; Tore Podola, Monheim, and Bernhard Knop, Monheim-Blee, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Filed Apr. 24, 1989, Ser. No. 342,408

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1988, 3814078

Int. Cl.[5] C08L *33/08, 1/26*; C09D *3/81*; C09K *3/10*

U.S. Cl. 524—43 **18 Claims**

1. A joint-sealing or coating composition consisting essentially of:

(a) an aqueous dispersion containing from about 40 to about 70% by weight of polyacrylate or acrylate copolymers; and

(b) from about 0.4 to about 6% by weight of a nonionic cellulose ether selected from the group consisting of hydroxyethyl cellulose, hydroxyethyl-methyl cellulose, hydroxypropyl-methyl cellulose and hydroxypropyl cellulose having a Brookfield viscosity in a 2% aqueous solution at about 20° C. of at least about 3,000 mPa.s, based on the solids content of said dispersion.

5,004,770

POLYMERIC SUBSTRATES STABILIZED WITH N-SUBSTITUTED HINDERED AMINES

Frank P. Cortolano, Valhalla; Raymond Seltzer, New City, and Ambelal R. Patel, Ardsley, all of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 259,955, Oct. 19, 1988, abandoned. This application Oct. 3, 1989, Ser. No. 416,621

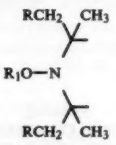
Int. Cl.[5] C08K *5/3435*

U.S. Cl. 524—99 **23 Claims**

1. A stabilized composition comprising

(a) an organic polymer containing hetero atoms, double bonds or aromatic rings and

(b) an effective stabilizing amount of a substituted hindered amine derivative containing the group



wherein R is hydrogen or methyl, and R_1 is hydrogen, C_1–C_{18} alkyl, C_2–C_{18} alkenyl, C_2–C_{18} alkynyl, C_5–C_{12} cycloalkyl, C_6–C_{10} bicycloalkyl, C_5–C_8 cycloalkenyl, C_6–C_{10} aryl, C_7–C_9 aralkyl, C_7–C_9 aralkyl substituted by alkyl or aryl, or

wherein D is C_1–C_{18} alkyl, C_1–C_{18} alkoxy, phenyl, pheny substituted by hydroxy, alkyl or alkoxy, or amino or amino mono- or disubstituted by alkyl or phenyl.

5,004,771

AQUEOUS DISPERSIONS OF CROSSLINKABLE SILICONES/SILICONATES

Michel Feder, Illfurth, and Jean-Marc Frances, Villeurbanne, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Oct. 11, 1989, Ser. No. 419,701

Claims priority, application France, Oct. 11, 1988, 88 13617

Int. Cl.[5] C08K *5/54*

U.S. Cl. 524—161 **14 Claims**

1. A composition of matter which comprises an aqueous dispersion of a silicone crosslinkable into elastomeric state by elimination of water therefrom under ambient conditions, said silicone dispersion comprising:

(A) 100 parts by weight of an oil-in-water emulsion of an α,ω-(dihydroxy)polydiorganosiloxane, stabilized with at least one anionic or nonionic surface-active agent, or admixture thereof;

(B) 0.to 15 parts by weight, calculated as the solids content, of an alkali or alkaline earth metal organosiliconate in aqueous solution; and

(C) 5 to 250 parts by weight of a nonsiliceous inorganic filler material; and said dispersion having a pH higher than 7 and a solids content of at least 40%, said aqueous dispersion being devoid of any curing catalyst.

5,004,772

ASPHALT ROOFING COMPOSITIONS ESPECIALLY ADAPTED FOR COLD APPLICATIONS

Kenneth F. Grzybowski, Temple Terrace, and Brian J. Anthony, Tampa, both of Fla., assignors to Gardner Asphalt Corporation, Tampa, Fla.

Filed Nov. 20, 1989, Ser. No. 438,846
Int. Cl.[5] C08L *9/00, 11/00, 95/00*; C08K *5/01*
U.S. Cl. 524—62 **3 Claims**

1. A roofing composition especially adapted for cold applications consisting essentially of:

		Parts By Weight (Based on Total Composition)
1.	asphalt having a	20–90
2.	synthetic hydrocarbon copolymer elastomer	1–30
3.	an organic hydrocarbon solvent for said asphalt and at least partially for said synthetic copolymer elastomer which is miscible with cyclohexanone	0–30
4.	cyclohexanone	4–35
5.	inert filler	0–30
6.	fiber	0–20

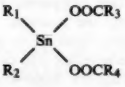
5,004,773

COMPOSITIONS BASED ON VINYLIDENE FLUORIDE POLYMERS, WHICH HAVE A REDUCED SMOKE-PRODUCING CAPACITY

Anthony Simoens, Vedrin, and Etienne Hannecart, Tervueren, both of Belgium, assignors to SOLVAY & Cie (Société Anonyme), Brussels, Belgium

Filed Apr. 9, 1987, Ser. No. 36,381
Claims priority, application France, Apr. 21, 1986, 86 05839
Int. Cl.[5] C08K *5/00*
U.S. Cl. 524—178 **9 Claims**

1. Compositions based on vinylidene flouride polymers, which have a reduced smoke-producing capacity, characterized in that they contain, as smoke-reducing agent, an effective amount of dialkyltin dicarboxylate of general formula:



in which R_1 and R_2, which may be identical or different, represent alkyl radicals containing from 1 to 6 carbon atoms and R_3 and R_4, which may be identical or different, represent alkyl radicals containing from 8 to 20 carbon atoms; and wherein the polymers comprise at least 90 mole percent of vinylidene fluoride.

5,004,774

THERMOSETTING POLYIMIDE RESIN COMPOSITION

Jong K. Yeo; Chung S. Kim; Dong J. Lee, and Sung H. Jang, all of Chungcheongnam, Rep. of Korea, assignors to Lucky, Ltd., Seoul, Rep. of Korea

Filed Dec. 23, 1988, Ser. No. 289,308
Claims priority, application Rep. of Korea, Dec. 29, 1987, 87-15197; Dec. 31, 1987, 87-15568
Int. Cl.[5] C08K *5/24, 5/54*
U.S. Cl. 524—262 **8 Claims**

1. A thermosetting polyimide resin composition, comprising
(1) 20 to 60 parts by weight of a modified bismaleimide resin prepared by the Michael addition reaction of bismaleimides with aromatic primary diamines and aromatic secondary diamines;
(2) 40 to 80 parts by weight of an inorganic filler;
(3) 0.8 to 25 parts by weight of silicone oil; and
(4) 0.5 to 5.0 parts by weight of a mixed catalyst composed of organic peroxides and imidazole compounds.

5,004,775

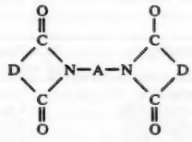
POLYIMIDE RESIN LAMINATES

Larry D. Olson, Viroqua, and Jeffrey R. Kamla, West Salem, both of Wis., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 187,158, Apr. 28, 1988, Pat. No. 4,876,325. This application Sep. 28, 1989, Ser. No. 413,883
Int. Cl.[5] C08L *79/08*
U.S. Cl. 524—371 **10 Claims**

1. A thermosetting resin composition consisting essentially of

(a) a bisimide having the formula:



where:
A comprises at least one of alkylene radicals having 1 to 20 carbon atoms, cycloalkylene radicals having 4 to 40 carbon atoms, heterocyclic radicals containing at least one of O, S, or N, phenylene or polycyclic aromatic radicals.
D is a divalent radical containing a carbon-carbon double bond
(b) a polyphenol;
(c) dicyandiamide, where the weight of (a), (b), and (c) are 80 to 98%/1 to 10%/and 0.1 to 10%, respectively, based on the total weight of (a), (b), and (c) and (d) octabromodiphenyl oxide in an effective amount up to about 5 weight percent.

5,004,776

STABILIZED CHLORINE-CONTAINING RESIN COMPOSITION

Masahiko Tadenuma, Akigawa; Tetsuhiro Miyagi, Akishima, and Tadashi Miyazawa, Sagamihara, all of Japan, assignors to Akishima Chemical Industries Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1989, Ser. No. 382,484
Claims priority, application Japan, Apr. 27, 1989, 1-106068
Int. Cl.[5] C08K *11/00*
U.S. Cl. 524—377 **26 Claims**

1. A thermally stabilized chlorinecontaining resin composition comprising a chlorine-containing resin and a stabilizer consisting essentially of (a) an overbased alkaline earth metal carboxylate or phenolate complex, (b) zeolite, (c) calcium hydroxide and (d) a complex obtained by reacting hydrates of at least one metal perchlorate $Me(ClO_4)_n$ in which n is 1 or 2 selected from the group consisting of $NaClO_4$, $Mg(ClO_4)_2$, $Ca(ClO_4)_2$ and $Ba(ClO_4)_2$ with at least one compound selected from the group consisting of aliphatic dihydric and trihydric alcohols and their lower alkyl, phenyl, and benzyl monoethers at a weight ratio of 10:90 to 70:30, the complex being liquid at ordinary temperature.

26. A composition according to claim 1, wherein the component (d) of the stabilizer is a complex represented by q wherein $Me(ClO_4)_n$ is as defined in claim 1 and R is the residue of aliphatic dihydric or trihydric alcohols or their lower alkyl, phenyl or benzyl monoethers and p is an integer of 1 to 3, and q is an arbitrary number of 1–6.

5,004,777

IMIDE POLYMERS

Michael P. Hallden-Abberton, Maple Glen; Newman M. Bortnick, Oreland; Leslie A. Cohen, Langhorne, all of Pa.; William T. Freed, Stockton, N.J., and Harry C. Fromuth, Trevose, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 452,991, Dec. 19, 1989, Pat. No. 4,954,574, which is a continuation of Ser. No. 108,383, Nov. 23, 1987, abandoned, which is a division of Ser. No. 770,034, Aug. 27, 1985, Pat. No. 4,727,117. This application May 24, 1990, Ser. No. 527,980

Int. Cl.[5] C08K *3/18*

U.S. Cl. 524—433 20 Claims

1. A blend of at least one thermoplastic polymer and a second polymer containing glutarimide units wherein the degree of imidization, by weight, on said polymer is from about 1% to about 95%, and the degree of imidization and the acid and anhydride functionality on said polymer, expressed in milliequivalents per gram of total imidizable and imidized polymer units are as set forth below;

when the degree of imidizaton on said polymer is	the milliequivalents of acid and anhydride per gram are
from about 1% to about 10%	0 to about 0.20
above about 10% to about 20%	0 to about 0.28
above about 20% to about 30%	0 to about 0.32
above about 30% to about 40%	0 to about 0.31
above about 40% to about 50%	0 to about 0.28
above about 50% to about 60%	0 to about 0.28
above about 60% to about 70%	0 to about 0.27
above about 70% to about 80%	0 to about 0.28
above about 80% to about 90%	0 to about 0.33
and above about 90% to about 95%	0 to about 0.40.

5,004,778

PROCESS FOR THE PREPARATION OF ULTRASTRETCHABLE POLYMER MATERIAL, ULTRASTRETCHABLE MATERIAL, AS WELL AS A PROCESS FOR THE MANUFACTURE OF OBJECTS

Geert N. Waagen, Baarn; Cornelis W. M. Bastiaansen, Dongen, and Robert Kirschbaum, Sittard, all of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed May 23, 1988, Ser. No. 197,361

Claims priority, application Netherlands, May 22, 1987, 8701219

Int. Cl.[5] C08L *23/04;* C08K *5/01*

U.S. Cl. 524—474 14 Claims

1. Process for the preparation of ultrastretchable polymer material starting from ethylene polymer particles with a low entanglement density and an average molecular weight (MW) higher than 400,000, wherein a mixture of the ethylene polymer particles and a process auxiliary agent, is compressed to a coherent material at a temperature below the melting point of the pure polymer and less than 30° C. below the dissolution temperature for a mixture consisting of the quantities of polymer and process auxiliary agent being used and wherein said dissolution temperature is below the melting point of the pure polymer and wherein the process auxiliary agent and the ratio of the process auxiliary agent to polymer are chosen to provide an ultrastretchable polymer material.

7. Process according to claim 1, characterized in that the process auxiliary agent is xylene, decaline, paraffin oil or paraffin wax.

5,004,779

PROCESS FOR THE PREPARATION OF AQUEOUS, OXIDATIVELY DRYING ALKYD RESINS AND THEIR USE IN OR AS AQUEOUS LACQUERS AND COATING COMPOUNDS

Harald Blum, Wachtendonk; Jürgen Meixner, Krefeld; Manfred Schreckenberg, Krefeld; Lothar Fleiter, Krefeld, and Wolfgang Wellner, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 10, 1990, Ser. No. 462,785

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1989, 3901190

Int. Cl.[5] C08G *63/76, 63/48, 18/42;* C09D *3/72*

U.S. Cl. 524—591 8 Claims

1. A process for the preparation of aqueous, oxidatively drying alkyd resins having a solids content above 40% by weight which comprises reacting components:

(a) from 70 to 88% by weight of an alkyd resin having a hydroxyl number of from 100 to 200 and an acid number not greater than 5, prepared by reacting:

(a1) from 40 to 70% by weight of a monocarboxylic acid containing at least 60% by weight of at least one unsaturated fatty acid capable of oxidative drying,

(a2) from 7 to 20% by weight of a dicarboxylic acid component which is at least one dicarboxylic acid, at least one dicarboxylic acid anhydride, or both,

(a3) from 0 to 10% by weight of a diol, and

(a4) from 10 to 30% by weight of one at least trifuntional polyol component;

(b) from 4 to 7% by weight of a 2,2-bis(hydroxymethyl)alkane carboxylic acid; and

(c) from 10 to 23% by weight of a diisocyanate component containing at least one organic diisocyanate having a molecular weight between 168 and 294;

said process being a one-step synthesis in a 70 to 95% by weight organic solution which comprises introducing components (a) and (b) into a reaction vessel, homogenizing components (a) and (b) with organic solvent, reacting homogenized components (a) and (b) with component (c) at a temperature between 50° to 120° C. in the presence of from 0.01 to 2.5% by weight of a catalyst, whereby a resin having a molecular weight of between 10,000 to 70,000 and an acid number between 18 and 36 is obtained, which resin contains free hydroxyl groups but no free isocyanate groups, and thereafter dispersing or dissolving the reaction mixture in water to achieve a product having from 45 to 100% of the carboxyl groups in the product converted into carboxylate groups during the reaction or during the dispersing or dissolving of the reaction mixture.

5,004,780

CYCLIC MONOPEROXYKETAL

Kazuo Matsuyama, Gamagori; Takashi Sugiura, Nagoya, and Takeshi Komai, Chita, all of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

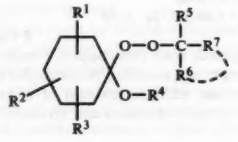
Filed Mar. 8, 1989, Ser. No. 320,591

Claims priority, application Japan, Mar. 10, 1988, 63-54752; Mar. 10, 1988, 63-54753

Int. Cl.[5] C08L *67/06;* C08F *4/34;* C07C *409/18*

U.S. Cl. 525—27 19 Claims

1. A cyclic monoperoxyketal represented by the following general formula



(I)

wherein R^1, R^2 and R^3 represent hydrogen atoms, or same or different alkyl groups having 1–3 carbon atoms, R^4 represents an alkyl group having 1–5 carbon atoms, R^5 represents an alkyl group having 1–3 carbon atoms, and R^6 and R^7 may be separate groups, in which R^6 represents an alkyl group having 1–3 carbon atoms and R^7 represents an alkyl group having 2–10 carbon atoms, a cycloalkyl group or an aryl group, or may be combined into a cycloalkylene group having 3–12 carbon atoms.

5,004,781

SYNTHETIC POLYSTYRENE RESIN AND ITS USE IN SOLID PHASE PEPTIDE SYNTHESIS

Hans Rink, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 171,049, Mar. 21, 1988, Pat. No. 4,859,736. This application May 17, 1989, Ser. No. 353,311

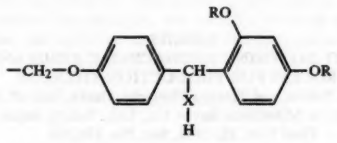
Claims priority, application Switzerland, Mar. 30, 1987, 1214/87

Int. Cl.[5] C08F *283/00;* **C08G** *63/48, 63/91*

U.S. Cl. 525—54.11 **8 Claims**

1. A process for the manufacture of peptides or peptide amides, characterised in that

(a) a synthetic resin based on polystyrene which is cross-linked with from 0 to 5 mol % of divinyl benzene and wherein benzene rings of the skeletal structure are substituted by groups of the formula



(I)

in which X represents —O— or —NH— and R represents C_1–C_4-alkyl is reacted with a compound of formula W^1—AM-[1]—Y—H, in which Y represents —O— or —NH—, W^1 represents an N-terminal amino-protecting group and AM^1 represents the acyl radical of an amino acid sequence, consisting of from 1 of 25 amino acid residues, in which functional groups are protected or unprotected, or with a reactive functional derivative thereof, for the purpose of attaching the W^1—AM-[1]—residue to the —X— group of the resin,

(b) the N-terminal protecting group W^1 is removed,

(c) the freed N-terminal amino group is acylated by reaction with an acid of formula W^2—AM^2—OH, in which W^2 represents an N-terminal amino protecting group and AM^2 represents the acyl radical of an amino acid sequence, consisting of from 1 to 25 amino acid residues, in which functional groups are protected or unprotected, or with a reactive functional derivative thereof,

(d) the operation of alternate removal according to (b) and acylation according to (c) is repeated as required until the desired amino acid sequence is obtained, and

(e) the resulting peptide or peptide amide, prior to, after, or with simultaneous removal of any protecting group, is detached from the resin by acidolysis with a mild acidic agent selected from the group consisting of trifluoroacetic acid, a lower alkanecarboxylic acid, a pyridinium salt, and mixtures thereof with an inert organic diluent.

5,004,782

THERMOPLASTIC RESIN COMPOSITION

Kentaro Mashita; Takeshi Fujii, and Tadayuki Oomae, all of Chiba, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Continuation of Ser. No. 67,437, Jun. 29, 1987, abandoned, which is a continuation of Ser. No. 768,154, Aug. 22, 1985, abandoned. This application Sep. 29, 1989, Ser. No. 414,574

Claims priority, application Japan, Aug. 31, 1984, 59-183250

Int. Cl.[5] C08L *51/06, 23/14, 23/12*

U.S. Cl. 525—64 **8 Claims**

1. A thermoplastic resin composition consisting essentially of:

(1) 100 parts by weight of a resin composition (D) defined below, and

(2) 2 to 30 parts by weight of copolymer (C) consisting of:

(a) 99.9 to 50% by weight of ethylene and 0.1 to 50% by weight of an unsaturated epoxy compound selected from the group consisting of glycidyl acrylate, glycidyl methacrylate, glycidyl itaconate, allyl glycidyl ether, 2-methylallyl glycidyl ether and p-styryl glycidyl ether, or

(b) 99.9 to 50% by weight of ethylene, 0.1 to 50% by weight of said unsaturated epoxy compound defined above and an ethylenically unsaturated compound selected from the group consisting of vinyl acetate, methyl acrylate, ethyl acrylate, methyl methacrylate, vinyl chloride, vinylidene chloride, and isobutyl vinyl ether,

said resin composition (D) beig composed of 50 to 90 wt. % of polypropylene resin (A) which is 5-100% by weight of a grafted polymer consisting of a polypropylene and 0.05 to 20 wt. % of an unsaturated carboxylic acid or anhydride thereof, selected from the group consisting of acrylic acid, methacrylic acid, maleic acid, itaconic acid, maleic anhydride and itaconic anhydride, and

95-0% by weight of a polypropylene, and 50 to 10 wt. % of saturated polyester resin (B) composed of a dicarboxylic acid moiety, wherein at least 40 mol % of said dicarboxylic acid moiety is terephthalic acid, and a diol moiety.

5,004,783

BLENDS OF HIGH NITRILE COPOLYMERS AND THERMOPLASTIC POLYMERS

Elena S. Percec, Pepper Pike, Ohio, and Doreen Y. Takigawa, Los Alamos, N. Mex., assignors to The Standard Oil Company, Cleveland, Ohio

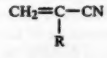
Filed Aug. 22, 1988, Ser. No. 235,015

Int. Cl.[5] C08L *33/20, 51/04, 33/26, 39/04*

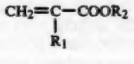
U.S. Cl. 525—77 **9 Claims**

1. A polymer blend comprising:

a high nitrile copolymer prepared by the polymerization of 100 parts by weight of (A) from 60 percent to 90 percent by weight of at least one nitrile having the structure

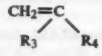


wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen, and (B) from 10 percent to 40 percent by weight based on the combined weights of (A) and (B) of at least one member selected from the group consisting of (1) an ester having the structure

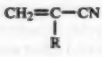


wherein R_1 is hydrogen, an alkyl group having from 1 to 6 carbon atoms, or a halogen, and R_2 is an alkyl group having

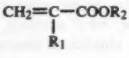
from 1 to 30 carbon atoms, (2) an alpha-olefin having the structure



wherein R_3 and R_4 are alkyl groups having from 1 to 7 carbon atoms, (3) a vinyl ether selected from the group consisting of methyl vinyl ether, ethyl vinyl ether, the propyl vinyl ethers, and the butyl vinyl ethers, (4) vinyl acetate, (5) styrene, and (6) indene, in the presence of from 0 to 40 parts by weight of (C) a rubbery polymer of a conjugated diene monomer selected from the group consisting of butadiene and isoprene and a comonomer selected from the group consisting of styrene, a monomer having the structure



wherein R has the foregoing designation, and an ester having the structure



wherein R_1 and R_2 have the foregoing respective designations, said rubbery polymer containing from 50 percent to 100 percent by weight of polymerized conjugated diene and from 0 percent to 50 percent by weight of comonomer; and

a compatible thermoplastic homopolymer or copolymer containing polar groups, consisting of the polymerization product formed from monomers selected from the group consisting of alkylacrylamides, unsaturated carboxylic acid anhydrides, vinyl pyrrolidones, heterocyclic ring compounds containing two hetero atoms, lactones and phosphorus-containing monomers that form highly crystalline polymers.

5,004,784

POLYMER BLENDS CONTAINING ISOCYANATE REACTING AGENTS

Gia Huynh-Ba, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 5, 1988, Ser. No. 177,663

Int. Cl.[5] C08L *23/00, 59/00, 67/02, 77/00*

U.S. Cl. 525—123 **40 Claims**

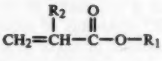
1. A composition consisting essentially of

(a) 0–95 weight percent of at least one thermoplastic polymer with a minimum number average molecular weight of 10,000 and a flexural modulus of greater than 150 kpsi, which has at least one functional group capable of reacting with an isocyanate group or which is end-capped with groups that can be removed between the melting point or glass transition temperature of the thermoplastic polymer and the decomposition point of the thermoplastic polymer to expose said at least one functional group;

(b) 100–5 weight percent of at least one thermoplastic polymer selected from the group consisting of polyesters and ethylene copolymers, wherein the thermoplastic polymer has a minimum number average molecular weight of 10,000, a flexural modulus of less than 150 kpsi, and at least one functional group capable of reacting with an isocyanate group or is end-capped with groups that can be removed between the melting point or glass transition temperature of the thermoplastic polymer and the decomposition point of the thermoplastic polymer to expose said at least one functional group, and wherein the ethylene copolymer is of the formula E/X/Y where

E is the radical formed from ethylene and E comprises 40–90 weight percent of the ethylene copolymer,

X is the radical formed from



where R_1 is an alkyl group with 2–8 carbon atoms and R_2 is a hydrogen, methyl, or ethyl group and X comprises 10–40 weight percent of the ethylene copolymer, and

Y is selected from the group consisting of glycidyl methacrylate and glycidyl acrylate and

Y comprises 0.5–20 weight percent of the ethylene copolymer,

and provided that when component (b) is present at greater than 95%, component (b) consists of at least two polymers that are incompatible with each other; and

(c) 0.3–5 weight percent, based upon the weight of (a) and (b) above, of at least one isocyanate reacting agent with functionality less than three;

provided that in a blend of component (a) with component (b), component (a) and (b) are incompatible with each other, and further provided that in all blends, there be at least 5 weight percent of component (a) or component (b) that is incompatible with at least one other polymer in the blend.

5,004,785

LIGHT-DIFFUSING METHACRYLIC RESIN AND PROCESS FOR PRODUCTION THEREOF

Kozo Ida, Tokyo, and Tetsuya Horiuchi, Otake, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1988, Ser. No. 276,955

Claims priority, application Japan, Nov. 30, 1987, 62-302085

The portion of the term of this patent subsequent to Oct. 6, 2007, has been disclaimed.

Int. Cl.[5] C08F *265/04, 267/06*

U.S. Cl. 525—305 **14 Claims**

1. A light-diffusing methacrylic resin comprising a dispersion of crosslinked fine particles in a substrate polymer comprising mainly methyl methacrylate, said crosslinked fine particles being obtained by copolymerizing at least either a phenyl group containing vinyl or a phenyl group containing (meth)acrylate with a polyfunctional monomer copolymerizable therewith, and said resin being characterized in that

(1) the difference between the refractive indexes of the crosslinked fine particles and the substrate polymer is 0.02 to 0.15,

(2) the concentration by weight of the polyfunctional monomer in the crosslinked fine particles is 5 to 20%,

(3) the average particle diameter of the crosslinked fine particles in the light-diffusing methacrylic resin is 5 to 20 μ, the percentage of particles having a particle diameter of 2 μ or less being less than 1% by weight in the total amount of the crosslinked fin particles to be mixed, the percentage of particles having a particle diameter of 30 μ or more being less than 0.5% by weight of the total amount of the crosslinked fine particles to be mixed, and

(4) the concentration by weight of the crosslinked fine particles in the light-diffusing methacrylic resin is 0.08 to 10%.

5,004,786

PROCESS FOR PRODUCING SULFOMETHYLAMIDE POLYMERS

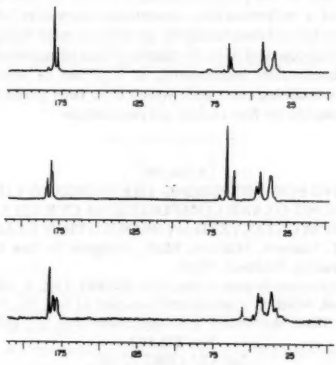
Dodd W. Fong, Naperville, and David J. Kowalski, LaGrange Park, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Continuation of Ser. No. 179,442, Apr. 8, 1988, abandoned, which is a continuation of Ser. No. 4,841, Jan. 12, 1987, Pat. No. 4,762,894. This application Oct. 6, 1989, Ser. No. 418,984

The portion of the term of this patent subsequent to Jun. 5, 2007, has been disclaimed.

Int. Cl.[5] C08F *8/34*

U.S. Cl. 525—344 **1 Claim**



1. A method of reacting polyacrylamide with formaldehyde and bisulfite to produce a terpolymer containing sulfomethyl acrylamide/acrylamide/acrylate, wherein the initial pH of the reaction mixture is less than about 12, and wherein the polyacrylamide, formaldehyde, and bisulfite reactants are heated together and agitated, and the reaction temperature is maintained at from 110° C. to about 250° C.

5,004,787

VULCANIZABLE RUBBER COMPOSITION WITH TRIAZINE THIOLS

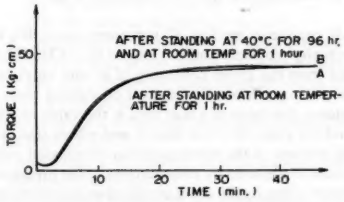
Tetsuo Tojo, Chiba; Keiji Okada, Ichihara; Takashi Nakahara, and Yoshiharu Kikuchi, both of Ichihara, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed May 19, 1988, Ser. No. 195,908

Claims priority, application Japan, May 22, 1987, 62-123665

Int. Cl.[5] C08C *19/22*

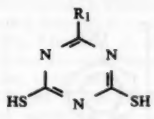
U.S. Cl. 525—332.1 **15 Claims**



1. A vulcanizable rubber composition comprising:

(a) a chlorine-containing rubber;

(b) as a vulcanization agent, a triazinethiol having the formula:

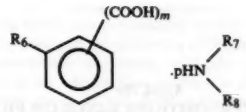


(II)

wherein R_1 represents $—NR_4R_5$, $—OR_4$ or $—SR_4$, where R_4 and R_5 independently represent a hydrogen atom, an alkyl group or an aryl group, the vulcanization agent present in a ratio of 0.001 to 0.025 mol per 100 g of the chlorine-containing rubber; and

(c) as a vulcanization aid, at least one component selected from the group consisting of:

(c-1) aromatic carboxylic acid amine salts having the formula:



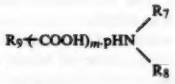
(III)

wherein m is a number of 1 to 3, p is a number of 1 to 3; $m \geqq p$;

R_6 represents a hydrogen atom, an alkyl group, a halogen, a nitro group, a cyano group or a hydroxy group;

R_7 and R_8 each represent a hydrogen atom, an alkyl or cycloalkyl group or an aryl group, and R_7 and R_8 may be bonded to each other to form a ring,

(c-2) aliphatic carboxylic acid amine salts having the formula:

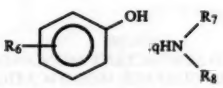


(IV)

wherein m, p, R_7, and R_8 are as defined above;

R_9 represents a monovalent to trivalent hydrocarbon group or a direct bond, and

(c-3) phenolamine salts having the formula:



(V)

wherein R_6, R_7 and R_8 are as described above, and g represents a number of 1 or 2.

5,004,788

CYANATO GROUP CONTAINING PHENOLIC RESINS, PHENOLIC TRIAZINES DERIVED THEREFROM

Sajal Das, Parsippany, and Dusan C. Prevorsek, Morristown, both of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

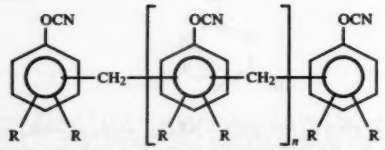
Division of Ser. No. 104,700, Oct. 5, 1987, Pat. No. 4,831,086. This application Mar. 1, 1989, Ser. No. 317,385

The portion of the term of this patent subsequent to May 16, 2006, has been disclaimed.

Int. Cl.[5] C08G *8/28*; C08L *61/06*

U.S. Cl. 525—504 **31 Claims**

1. A cyanato group containing phenolic resin of the formula



wherein n is o or an integer of 1 or more,

R is the same or different and is selected from hydrogen and methyl groups, the resin having a residual amount of phenyl cyanate of less than 2% by weight and said resin having a gel time of greater than 1 minute at 155° C.

5,004,789

NEW RESIN COMPOSITIONS BASED ON PHENOLIC RESINS

Francois Boinot, Lievin; Michel Cousin, Loison S/Lens; Pierre-Michel Francois, Bethune, and Francois Michel-Dansac, Bully-Les-Mines, all of France, assignors to Societe Chimiques des Charbonnages S.A., Paris La Defense, France

Filed Jun. 4, 1987, Ser. No. 58,055

Claims priority, application France, Jun. 5, 1986, 86 08127

Int. Cl.[5] C08C *8/28;* C08K *3/38;* B32B *3/02*

U.S. Cl. 525—506 29 Claims

1. In a composition suitable for the manufacture of phenolic prepreg mats, said composition comprising a phenol formaldehyde resin of the resol type, the improvement wherein said composition contains, as an additive to said resin (a) triethanolamine borate or (b) a mixture of an amine and boric acid or boric anhydride, the atomic ratio of boron atoms/nitrogen atoms in the boric acid or anhydride/amine mixture being between ½ and 4.

5,004,790

FLUORINATED SURFACTANT MONOMERS FOR POLYMER SURFACE MODIFICATION

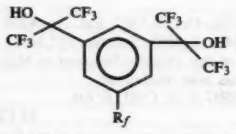
Daniel F. Harnish, Morristown; Donald Pickens, Mendham, and Andrew M. Zweig, West Orange, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Feb. 15, 1989, Ser. No. 311,316

Int. Cl.[5] C08F *12/20*

U.S. Cl. 526—242 7 Claims

1. A resin obtained by the reactive curing of a composition comprising a blend of at least one functionalized fluorinated monomer and at least one co-reactive non-fluorinated monomer, said fluorinated monomer being derived from compounds of the formula:



where R_f=H or C_nF_{2n+1} and n=1—18

5,004,791

ORGANOSILOXANE-CONTAINING POLYSACCHARIDES

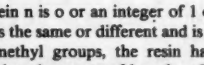
Robert L. Billmers, Stockton, N.J., assignor to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Division of Ser. No. 318,579, Mar. 3, 1989, Pat. No. 4,973,680. This application Sep. 10, 1990, Ser. No. 580,438

Int. Cl.[5] C08B *11/00, 37/16, 31/02, 33/02*

U.S. Cl. 527—300 12 Claims

1. A polysaccharide graft polymer, comprising the structure:



wherein Sacch- is a polysaccharide; m is zero or one; G is the residue of a polymerizable, unsaturated monomer which is bonded to the polysaccharide by an ether or ester linkage; n is greater than one; and M is the residue of one or more polymerizable, unsaturated, monomer(s), at least one of which is a siloxane-containing monomer, which have been grafted to the polysaccharide by free radical polymerization.

5,004,792

METHOD FOR EXTENDING THE WORKING LIFE OF ORGANOSILOXANE COMPOSITIONS CURABLE BY A PLATINUM CATALYZED HYDROSILATION REACTION

Myron T. Maxson, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 103,991, Oct. 1, 1987, abandoned, which is a continuation-in-part of Ser. No. 899,111, Aug. 22, 1986, abandoned. This application Jun. 27, 1988, Ser. No. 211,613

Int. Cl.[5] C08G *77/06*

U.S. Cl. 528—15 6 Claims

1. In a method for extending the working life at 25 degrees C. of a curable organosiloxane composition comprising

A. at least one triorganosiloxy terminated polydiorganosiloxane containing at least two vinyl radicals per molecule,

B. an amount sufficient to cure said composition of a organohydrogensiloxane containing at least two silicon bonded hydrogen atoms per molecule,

C. a platinum hydrosilation catalyst in an amount sufficient to promote curing of said composition at a temperature of at least 100 degrees C., and

D. an amount of inhibitor for said catalyst sufficient to extend the working time of said composition at room temperature, where said inhibitor is a vinyl-containing polydiorganosiloxane that constitutes at least a portion of said triorganosiloxy-terminated polydiorganosiloxane,

the improvement comprising selecting as the inhibitor portion of said triorganosiloxy terminated polyorganosiloxane at least one polydiorganosiloxane containing in each molecule at least one sequence of at least two organovinylsiloxane units and represented by the average formula

$$R^3R^4MeSi(OSiMeR^2)_x[(OSiRiVi)_y]_zOSiR^3R^4Me \quad (I)$$

where Me represents methyl, Vi represents vinyl, R^1, R^2 and R^3 individually represent methyl, phenyl or $—CH_2CH_2Rf$, R^4 is selected from the group consisting of R^1 and vinyl radicals, Rf represents a perfluoroalkyl radical containing from 1 to 8 carbon atoms, the value of x is at least 4, the value of y is from 2 to 5, and the value of z is at least 1, and where said catalyst-inhibiting portion of the triorganosiloxy-terminated polydiorganosiloxane is prepared by polymerizing in the presence of an acid catalyst a first cyclic diorganosiloxane containing repeating units of the formula ViR^1SiO, a second cyclic diorganosiloxane containing. repeating units of the formula MeR^2SiO and an organosilicon compound comprising at least one unit of the formula R^3R^4MeSiX or $R^3R^4MeSiO_{\frac{1}{2}}$, where X represents a hydrolyzable atom or group.

5,004,793

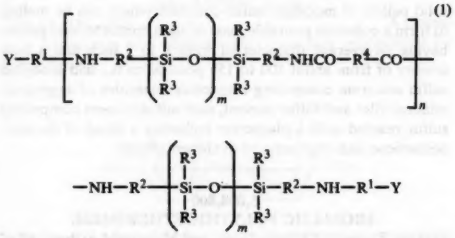
ROOM TEMPERATURE-CURABLE COMPOSITION

Hisayuki Nagaoka; Michio Zenbayashi, and Chiyuki Shimizu, all of Gunma, Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed Jul. 3, 1989, Ser. No. 374,796
Claims priority, application Japan, Jul. 1, 1988, 63-164391
Int. Cl.[5] C08G 77/06
U.S. Cl. 528—15 10 Claims

1. A room temperature-curable composition comprising

(a) 100 parts by weight of a siloxane-amide block copolymer represented by the formula (1)



(1)

wherein

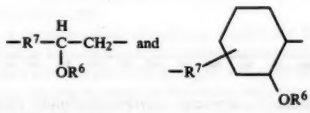
Y represents a hydrolyzable group containing organosilyl group of the formula $-SiR^5_aX_{3-a}$ in which

R^5 represents a substituted or unsubstituted monovalent hydrocarbon group,

a is an integer of 0, 1 or 2, and

X is directly bonded to the silicon atom and represents a hydrolyzable group or a hydroxyl group,

R^1 represents a divalent group selected from the group consisting of



in which

R^6 represents a hydrogen atom, a substituted or unsubstituted monovalent hydrocarbon group, or an organosilyl group of the formula $-SiR^8_bX_{3-b}$ in which

R^8 represents a substituted or unsubstituted monovalent hydrocarbon group,

b is an integer of 0, 1, 2, or 3, and

X is the same as defined above, and

R^7 represents a substituted or unsubstituted divalent hydrocarbon group which has 1 to 8 carbon atoms and may contain an ether bond including an oxygen or sulfur atom,

R^2 represents a substituted or unsubstituted divalent hydrocarbon group,

R^3 represents a substituted or unsubstituted monovalent hydrocarbon group,

R^4 represents a substituted or unsubstituted divalent aromatic hydrocarbon group, and

m and n each independently is a number of 1 or more;

(b) 0 to 25 parts by weight of a crosslinking agent; and

(c) 0.01 to 3 parts by weight of a curing catalyst.

5,004,794

ISOCYANATE PREPOLYMERS

Winfried Emmerling, Erkrath; Juergen Wichelhaus, Wuppertal, and Tore Podola, Monheim, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 4, 1987, Ser. No. 128,662
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1986, 3641776
Int. Cl.[5] C08G 18/10
U.S. Cl. 528—52 18 Claims

1. A process for the preparation of isocyanate prepolymers comprising the steps of

A. reacting a polyether and/or a polyester containing 2 hydroxyl groups and having a number average molecular weight of from about 500 to about 5000 with a diisocyanate in a molar ratio of from about 1 : 0.7 to about 1 : 1.3 until the content of free isocyanate groups in the resulting product is between about 0.4 and about 0.8% by weight; and

B. adding to the reaction mixture in step A a low molecular weight triol and the same or a different diisocyanate or a polyfunctional isocyanate, with the quantities of such components adjusted to produce a prepolymer having between about 1.5 and about 3.5% by weight of isocyanate groups, based on the weight of the prepolymer.

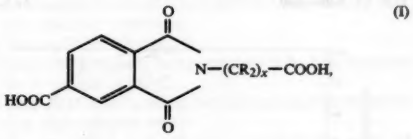
5,004,795

ALIPHATIC-AROMATIC POLYAMIDE-IMIDES

Wilfried Zecher; Aziz El-Sayed, both of Leverkusen; Wilfried Haese, Moenchengladbach; Burkhard Köhler, and Rolf-Volker Meyer, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Aug. 21, 1989, Ser. No. 396,145
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1988, 3829960
Int. Cl.[5] C08G 18/38
U.S. Cl. 528—73 8 Claims

1. A process for the preparation of shaped articles, comprising shaping polyamide-imides obtained by condensation of organic diisocyanates with imidocarboxylic acids (I) of the formula



(I)

in which

R independently of one another represent Hydrogen (H) or C_1–C_6-alkyl and

x represents the number 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 or 12,

at temperatures of 50° to 380° C., optionally in a solvent and optionally in the presence of a catalyst.

5,004,796

PREPARATION OF POLY(ARYLATE) USING A NON-SOLVENT

Richard Vicari, Chatham; John R. Costanza, Plainfield; Ronald R. Lamonte, Flanders, and Ralph M. Miano, Summit, all of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Jan. 12, 1990, Ser. No. 464,395
Int. Cl.[5] C08G 63/02, 63/18, 63/00, 67/00
U.S. Cl. 528—179 30 Claims

1. In a process for the production of polyarylates by reacting under esterification conditions a reaction mixture of a diester of a dihydric phenol, at least one aromatic dicarboxylic acid and

an inert diluent, the improvement wherein said diluent is a poly(fluorinated alkylene oxide).

5,004,797

PARTLY FLUORINATED CARBOXYLIC ACIDS AND DERIVATIVES THEREOF, PROCESSES FOR THEIR PREPARATION AND THEIR USE

Freimund Röhrscheid, Kelkheim; Günter Siegemund, and Jürgen Lau, both of Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

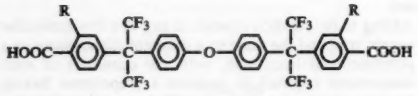
Filed Nov. 23, 1988, Ser. No. 275,405

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1987, 3739796; Nov. 24, 1987, 3739797; Nov. 24, 1987, 3739800

Int. Cl.[5] C08G *63/12*

U.S. Cl. 528—206 23 Claims

1. A compound of the formula



(I)

in which R represents hydrogen or —COOH, and the acid chloride of the compound of formula (I) with the proviso that R is hydrogen, and the dianhydride of the compound of formula (I) with the proviso that R represents the radical —COOH.

5,004,798

POLYACETAL COPOLYMERS OF TRIOXANE AND TRIMETHYLOLPROPANE FORMAL DERIVATIVES

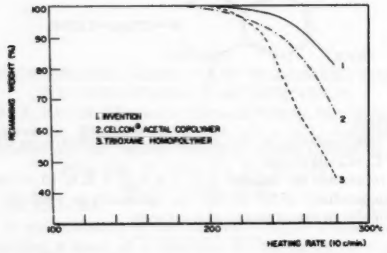
Jerry A. Broussard, Summit; Andrew B. Auerbach, Livingston, both of N.J.; Nan L. Yang, Staten Island, N.Y.; James L. Paul, Summit, N.J.; Yong C. Zheng, New York, and Chong L. Zhang, Staten Island, both of N.Y., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed May 12, 1989, Ser. No. 350,799

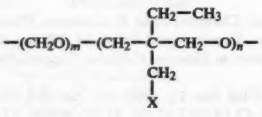
The portion of the term of this patent subsequent to Dec. 4, 2007, has been disclaimed.

Int. Cl.[5] C08G *4/00*

U.S. Cl. 528—230 17 Claims



1. As essentially linear acetal copolymer of the formula:



where X is an ester radical or a hydroxyl radical obtained by hydrolyzing an ester radical, and m and n are each integers such that m+n is between 5 to 20000, and the mole ratio of units of subscript n to the units of subscript m is between about 1:5000 to 1:1, and wherein said acetal copolymer is the reaction product of trioxane and an ester derivative of trimethylolpropane formal.

5,004,799

PELLETIZED SULFUR CONCRETE AND METHOD OF PREPARING SAME

Dennis E. Kohls, Salina, and Francis M. Moser, Sabetha, both of Kans., assignors to Reece Construction Company, Inc., Scandia, Kans.

Filed Sep. 20, 1989, Ser. No. 409,677

Int. Cl.[5] C08K *3/00;* C08L *47/00*

U.S. Cl. 528—389 1 Claim

1. A concrete product comprising discrete, substantially solid pellets of modified sulfur concrete which can be melted to form a coherent pourable mass of such concrete, said pellets having an average diameter of from ¼ to 1 inch and a bulk density of from about 100 to 155 pounds/cu.ft., said modified sulfur concrete comprising respective quantities of aggregate, mineral filler and sulfur cement, said sulfur cement comprising sulfur reacted with a plasticizer including a blend of dicyclopentadiene and oligomers of cyclopentadiene.

5,004,800

AROMATIC POLYTHIOETHERIMIDE

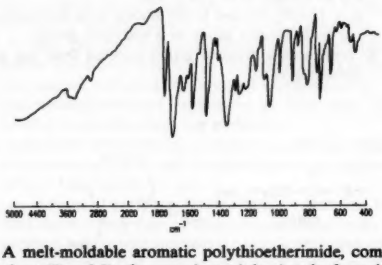
Makoto Terauchi; Chikako Ikeda, and Mitsutoshi Aritomi, all of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1988, Ser. No. 204,278

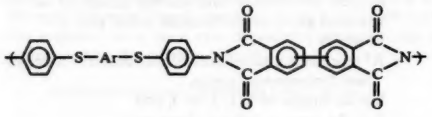
Claims priority, application Japan, Jun. 12, 1987, 62-146754

Int. Cl.[5] C08G *69/26, 69/28*

U.S. Cl. 528—351 6 Claims

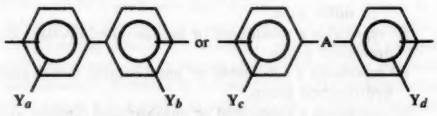


1. A melt-moldable aromatic polythioetherimide, comprising at least 50 mol % of a repeating unit having the formula (I):



(I)

wherein Ar represents:



wherein A represents O, CO, SO, SO_2 or C_yH_{2y}, y represents an integer of from 1 to 10; Y represents an alkyl group having form 1 to 20 carbon atoms, an aralkyl group having from 7 to 20 carbon atoms, a cycloalkyl group having from 3 to 20

carbon atoms, an aryl group having from 6 to 20 carbon atoms, a halogen atom or a nitro group; and a, b, c and d each represents 0 or an integer of from 1 to 4, with the total of the repeating unit or units being 100 mol %.

5,004,801

POLYMER OF DITHIOETHER-LINKED PHTHALONITRILE

Teddy M. Keller, Alexandria, Va., and Thomas R. Price, deceased, late of Fort Washington, Md. (by Carolyn R. Price, legal representative), assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 21, 1988, Ser. No. 274,216
Int. Cl.[5] C08G *83/00*
U.S. Cl. 528—360 6 Claims

1. A polymer of a phthalonitrile monomer represented by the formula:

wherein A is selected from the group consisting of an aliphatic hydrocarbon having from 2 to 30 carbon atoms, a cyclic hydrocarbon having from 4 to 30 carbon atoms, and mixtures thereof.

5,004,802

100KDA PROTEIN FROM BLOOD WHICH BINDS TO AND INHIBITS THE ACTIVITY OF PLASMINOGEN ACTIVATORS

Cornelis Kluft, Sassenheim, Netherlands, assignor to Nederlandse Centrale Organisatie Voor Teegepast-Natturwentenschappelijk Orderzoel, The Hague, Netherlands

Filed Jul. 11, 1986, Ser. No. 884,418
Claims priority, application Netherlands, Jul. 12, 1985, 8502017
Int. Cl.[5] A61K *37/02*; C07K *15/06, 15/14*
U.S. Cl. 530—380 1 Claim

1. A protein called plasminogen activator binding protein purified so as to be free from contamination with materials that interfere with the plasminogen activator binding activity of the protein, having at least the following properties;

(a) it has a molecular mass of about 100,000 daltons as determined by gel chromatography on ULTROGEL ® ACA 44;

(b) it has an electrophoretic mobility in agarose at pH 8.6 equal to that of plasma β-globulins;

(c) it migrates to an isoelectric point of from 6.5 to 7.5;

(d) the protein binds specifically and reversibly to urokinase having a free active center;

(e) the protein binds specifically and reversibly to t-PA having a free active center and specific Kringle-2; and

(f) the protein is thermostable so that it remains its plasminogen activator binding activity when heated to up to at least 56° C.

5,004,803

PRODUCTION OF PROCOAGULANT PROTEINS

Randal J. Kaufman, Boston, and Debra Pittman, Arlington, both of Mass., assignors to Genetics Institute, Inc., Cambridge, Mass.

Filed Nov. 14, 1988, Ser. No. 270,882
Int. Cl.[5] C07K *13/00*; C12N *5/06*; C07H *15/12*; C11N *15/64*
U.S. Cl. 530—383 5 Claims

1. A DNA encoding a procoagulant-active protein characterized by a peptide sequence of human Factor VIII except within the B domain where it is characterized by peptide sequence of human Factor V.

5,004,804

METHOD AND COMPOSITION FOR PREPARATION OF FACTOR VIIIC

George Kuo; Frank Masiarz, both of San Francisco; Martha Truett, Oakland, and Pablo Valenzuela, San Francisco, all of Calif., assignors to Nordisk Gentofte, Gentofte, Denmark

Filed Jan. 12, 1984, Ser. No. 570,062
Int. Cl.[5] C07K *15/28*
U.S. Cl. 530—387 3 Claims

1. Monoclonal antibodies prepared in response to an immunogen and specifically binding to said immunogen, said immunogen consisting of a protein composition substantially free of other proteins and consisting of a complex of an 80kd and 77kd protein calcium bridged with a 92.5kd protein exhibiting a biological activity of Factor VIIIC.

5,004,805

HEPATOCYTE GROWTH FACTOR

Eiichi Gohda, 1-51-2-31 Kinkodai; Hirohito Tsubouchi, 1925 Harara-cho, both of Kagoshima-shi, Kagoshima-ken; Hiroyuki Nakayama, Kagoshima; Shuichi Hirono, Kagoshima; Kozo Takahashi, Kagoshima; Shuji Hashimoto, 6-49-3 Murasakibaru, and Yasushi Daikuhara, 4-14-10-41 Meiwa, both of Kagoshima-shi, Kagoshima-ken, all of Japan, assignors to Shuji Hashimoto; Yasushi Daikuhara; Eiichi Gohda; Hirohito Tsubouchi, all of Kagoshima and Mitsubishi Kasei Corporation, Tokyo, all of, Japan

Filed Jun. 4, 1987, Ser. No. 58,211
Claims priority, application Japan, Jul. 14, 1986, 61-166495
Int. Cl.[5] C07K *7/10, 15/00*
U.S. Cl. 530—399 3 Claims

1. A substantially purified and isolated human hepatocyte growth factor, comprising a proteinaceous substance which exhibits the following physicochemical properties and physiological activity:

(i) having a molecular weight which is estimated to be approximately 76,000–92,000 by SDS-PAGE analysis, under non-reductive conditions;

(ii) having HGF activity;

(iii) said HGF activity being inactivated by heat treatment for 10 minutes at 80° C.;

(iv) said HGF activity being lost by digestion with trypsin or with chymotrypsin; and

(v) having such a high affinity for heparin that when adsorbed by Heparin-Sepharose column, said growth factor is not eluted therefrom below 0.8M NaCl in a PBS(−) buffer at pH 7.4 containing 0.013% Triton X-100.

5,004,806

NITROCELLULOSE FILTRATION TO REMOVE PROTEINS FROM POLYNUCLEOTIDES

Viola T. Kung, Menlo Park, Calif., assignor to Molecular Devices Corporation, Palo Alto, Calif.

Filed Oct. 17, 1988, Ser. No. 258,895
Int. Cl.[5] C12N *15/10*; C07K *3/18, 3/26, 3/28*
U.S. Cl. 530—415 20 Claims

1. A method for quantitatively removing microgram quantities of proteins from a solution containing picogram quantities of polydeoxyribonucleotides having at least about 300 nucleotides per strand and microgram quantities of proteins comprising filtering the solution through a nitrocellulose membrane at neutral or basic pH.

5,004,807

COPPER FORMAZAN REACTIVE DYES CONTAINING A MONOFLUOROTRIAZINE OR MONOCHLOROTRIAZINE GROUP

Klaus Pandl, Ludwigshafen, and Manfred Patsch, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

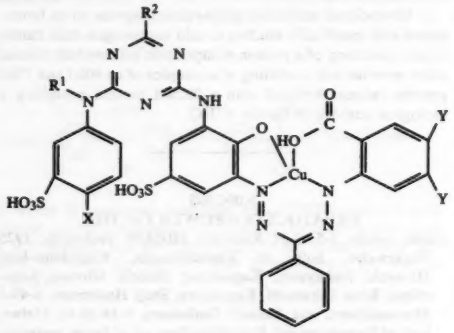
Filed Nov. 4, 1988, Ser. No. 267,347

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1987, 3737536

Int. Cl.[5] C09B *62/095, 50/00, 67/24;* D06P *3/66*

U.S. Cl. 534—618 2 Claims

1. A copper formazan reactive dye of the formula



where X is cyano, Cl, C_1–C_4-alkyl or C_1–C_4-alkoxy, one of the two radicals Y and Z is hydrogen and the other is hydroxysulfonyl, R^1 is hydrogen and R^2 is fluorine or chlorine, or a salt thereof.

5,004,808

AMINOALKYL-DERIVATIVES OF HYDROXYALKYL-CELLULOSES

Mansur Yalpani, and Magdy M. Abdel-Malik, both of Kirkland, Canada, assignors to Domtar Inc.

Filed Jul. 7, 1988, Ser. No. 216,129

Int. Cl.[5] C08B *11/02, 11/145, 11/193, 11/20*

U.S. Cl. 536—56 32 Claims

1. A product comprising a water soluble, (high molecular weight) (aminoalkyl) aminoalkyl - derivative of hydroxyalkyl cellulose,

said aminoalkyl derivative being selected from the group consisting of: amide and amine linked by an alkyl having at least one carbon atom, to the oxygen of the hydroxy group of said hydroxyalkyl cellulose, thereby replacing said hydrogen of the hydroxy group of said hydroxyalkyl, said hydroxyalkyl being a side chain of said cellulose, (said molecular weight being at least 50,000 daltons) said alkyl of said aminoalkyl derivative and said alkyl of said hydroxyalkyl may contain other compatible functional groups and at least one of the hydrogen of said NH_2 of said amino being optionally substituted with alkyl and alkyl having other functional groups said other functional groups not hindering the functionality of the amino groups nor the portioning properties of said aminoalkyl derivatives.

5,004,809

NITROXIDE LABELED NUCLEOTIDES AND NITROXIDE LABELED HYBRIDIZATION PROBES

Albert M. Bobst, and Gary T. Pauley, both of Cincinnati, Ohio, assignors to University of Cincinnati, Cincinnati, Ohio

Filed Feb. 4, 1986, Ser. No. 826,064

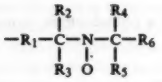
Int. Cl.[5] C07H *17/00*

U.S. Cl. 536—29 11 Claims

1. A 5'-triphosphate nucleotide wherein the base is selected from the group consisting of uracil and cytosine,

said base substituted at the C-5 position of the pyrimidine ring with a carbon atom,

said carbon atom further substituted with a nitroxide containing moiety wherein said nitroxide containing moiety has the following formula:



wherein R_1 represents C_1–C_{15} alkylene;

R_2 and R_4 represent a moiety selected from the group consisting of C_1–C_{15} alkyl and C_2–C_{15} alkylene;

R_3, R_5, R_6 represents C_1–C_5 alkyl.

5,004,810

ANTIVIRAL OLIGOMERS

Kenneth G. Draper, Madison, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Filed Sep. 30, 1988, Ser. No. 252,225

Int. Cl.[5] C07H *15/12, 47/00*

U.S. Cl. 536—27 3 Claims

1. An oligomer capable of hybridizing to the second translation initiation region downstream from the 5' end of messenger RNA coding for a herpes simplex virus Vmw65 transactivating protein and substantially inhibiting translation of such messenger RNA, which oligomer comprises bases substantially complementary to such translation initiation region linked by a backbone comprising ribose phosphate, deoxyribose phosphate, ribose alkylphosphonate, deoxyribose alkylphosphonate, ribose arylphosphonate or deoxyribose arylphosphonate.

5,004,811

TETRAPYRROLE AMINOCARBOXYLIC ACIDS

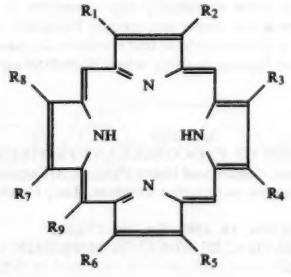
Jerry C. Bommer, Ogden, and Bruce F. Burnham, Logan, both of Utah, assignors to Nippon Petrochemicals Company, Ltd., Tokyo, Japan

Filed Dec. 24, 1987, Ser. No. 137,750

Int. Cl.[5] C07B *47/00*

U.S. Cl. 540—145 32 Claims

1. A fluorescent mono-, di-, tri- or tetramide of amino acid and a carboxy containing tetrapyrrole compound of the formula:



I

or the corresponding di- or tetrahydrotetrapyrroles, said amide

linkage being formed between the amino group of the amino acid and a carboxy-containing substituent attached to the tetrapyrrole; wherein

R_1 is methyl,

$$\begin{cases} -H \\ -CH_3 \end{cases} \text{ or } \begin{cases} -OH \\ -CH_3 \end{cases};$$

R_2 is H, vinyl, ethyl,

$$\begin{cases} -CHCH_3, \text{ acetyl,} \\ OH \end{cases} \quad \begin{cases} -H \\ \text{-ethyl,} \end{cases} \quad \begin{matrix} H \\ | \\ -C{=}O, \end{matrix}$$

$CH_2CH_2CO_2H$, or $=CHCHO$;

R_3 is methyl,

$$\begin{cases} -H \\ -CH_3 \end{cases} \text{ or } \begin{cases} -CH_3 \\ -OH \end{cases};$$

R_4 is H, vinyl, ethyl,

$CHCH_3$
OH,

$CH_2CH_2CO_2H$, $=CHCHO$, or

$$\begin{cases} -H \\ \text{-ethyl;} \end{cases}$$

R_5 is methyl;

R_6 is H, $CH_2CH_2CO_2H$, $CH_2CH_2CO_2R$ or CO_2H;

R_7 is $CH_2CH_2CO_2H$, $CH_2CH_2CO_2R$ or

$$\begin{cases} -CH_2CH_2CO_2H \\ -H \end{cases};$$

R_8 is methyl or

$$\begin{cases} -CH_3 \\ -H \end{cases};$$

R_9 is H, COOH, CH_2COOH or methyl;

provided that when R_1, R_2, R_3, R_4, R_7 and R_8 represent two substituents or are divalent and attached to the same carbon, the respective pyrrole ring to which attached is a dihydropyrrole;

$$\begin{matrix} -C{=}O \\ | \\ -CH_2 \end{matrix} \quad \text{or} \quad \begin{matrix} -C{=}O \\ | \\ -CHCO_2CH_3 \end{matrix}$$

with the proviso that at least one of R_1–R_9 includes a free carboxyl group; and salts thereof; and wherein the amino acid has the formula:

$$(A^1)_{n^1}[Z^1Y^1]-\overset{H}{\underset{|}{N}}-[YZ](A)_n \qquad \text{II}$$

wherein

each A^1 and A may be the same or different and are selected from the group consisting of COOH, SO_3H or OH with the proviso that said compound contains at least one COOH or SO_3H;

Z^1 and Z are independently an alkylene chain containing from 0–5 carbon atoms in the principal chain and up to a total of 8 carbon atoms;

Y^1 and Y are independently an alkylene chain containing from 0–5 carbon atoms in the principal chain and up to a total of 8 carbon atoms with the proviso that when both A and A^1 are other than SO_3H, then one of Y^1 or Y must contain at least one carbon atom in the principal chain; or

Y^1 and Y taken together with the nitrogen to which they are attached form an N-heterocycle containing from 4–9 ring carbon atoms and up to a total of about 15 carbon atoms; or

Y^1Z^1 or YZ individually may form a cycloalkyl group containing from 5 to 10 ring carbon atoms and up to a total of about 16 carbon atoms;

n^1 and n are independently 0, 1 or 2; and

$n^1+n=2$.

5,004,812

DIRECT POSITIVE DIMETHINE CYANINE DYES CONTAINING 1-ARYL-2-HETEROARYL INDOLE NUCLEUS

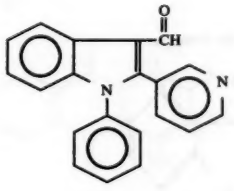
Thomas D. Weaver, Rochester, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 304,574, Jan. 31, 1989, Pat. No. 4,927,933, Division of Ser. No. 66,552, Jun. 26, 1987, Pat. No. 4,839,271. This application Jan. 22, 1990, Ser. No. 479,484

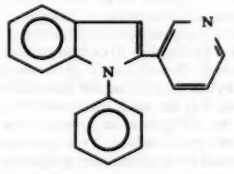
Int. Cl.[5] *C07C 401/00*

U.S. Cl. 546—201 **2 Claims**

1. 3-formyl-1-phenyl-2(3-pyridyl)-1H-indole having the formula:



2. 1-phenyl-2-(3-pyridyl-1H-indole having the formula:



5,004,813

CHROMOGENIC PHTHALIDES AND AZAPHTHALIDES

Rox Phaff, Rheinfelden, and Davor Bedekovic, Biel-Benken, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

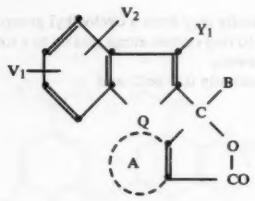
Division of Ser. No. 113,840, Oct. 26, 1987, Pat. No. 4,876,357. This application Aug. 24, 1989, Ser. No. 398,203

Claims priority, application Switzerland, Oct. 28, 1986, 4268/86; Jun. 5, 1987, 2148/87

Int. Cl.[5] C07D *405/04, 407/04*

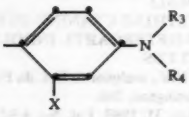
U.S. Cl. 548—463 9 Claims

1. A chromogenic phthalide or azaphthalide of the formula



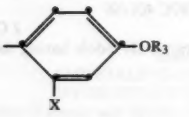
(I)

in which V_1 and V_2 are each, independently of the other, hydrogen, halogen, lower alkyl, lower alkoxy, (lower alkoxy)-carbonyl or $—NR_1R_2$, at least one of the radicals V_1 and V_2 being lower alkoxy or $—NR_1R_2$, A is an unsubstituted or halogen-, cyano-, nitro-, (lower alkyl)-, (lower alkoxy)-, (lower alkyl)thio-, (lower alkyl)-amino- or di(lower alkyl)amino-substituted benzene, naphthalene, pyridine, quinoline, pyrazine or quinoxaline ring, B is a substituted phenyl radical of the formula



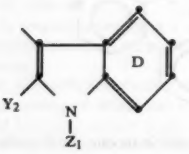
(Ia)

or



(Ib)

a 3-indolyl of the formula



(Ic)

Q is —O—, R_1, R_2, R_3 and R_4 are each, independently of the others, hydrogen, unsubstituted or halogen-, hydroxy-, cyanoor (lower alkoxy)-substituted alkyl having at most 12 carbon atoms, cycloalkyl having 5 to 10 carbon atoms or unsubstituted or halogen-, cyano-, (lower alkyl)- or (lower alkoxy)ringsubstituted phenalkyl or phenyl, or the substituent pairs (R_1 and R_2) and (R_3 and R_4) are each, independently of each other, together with the nitrogen atom joining them a five- or six-membered, heterocyclic radical, Y_1 is hydrogen, lower alkyl, cycloalkyl, phenalkyl or phenyl, Y_2 is hydrogen, lower alkyl or phenyl, Z_1 and is hydrogen, unsubstituted or halogen-, hydroxyl-, cyano- or (lower alkoxy)-substituted alkyl having at most 12 carbon atoms, acyl having 1 to 12 carbon atoms or unsubstituted or halogen-, cyano-, (lower alkyl)- or (lower alkoxy)-substituted benzyl, X is hydrogen, halogen, lower alkyl, C_1–C_{12}-alkoxy, C_1–C_{12}-acyloxy, benzyl, phenyl, benzyloxy, phenyloxy, halogen-, cyano-, (lower alkyl)- or (lower alkoxy)-substituted benzyl or benzyloxy, or the group $—NT_1T_2$, T_1 and T_2 are each, independently of the other, hydrogen, lower alkyl, cycloalkyl, unsubstituted or halogen-, cyano-, (lower alkyl)or (lower alkoxy)-substituted benzyl or acyl having 1 to 12 carbon atoms and T_1 is also unsubstituted or halogen-, cyano-, (lower alkyl)- or (lower alkoxy)-substituted phenyl, and the benzene nucleus D is unsubstituted or substituted by halogen, cyano, lower alkyl, lower alkoxy, (lower alkoxy)carbonyl, amino, mono(lower alkyl)amino or di(lower alkyl)amino.

5,004,814

SUBSTITUTED α-PYRONES AND PROCESS FOR THEIR PREPARATION

Vratislav Kvita, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

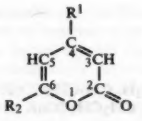
Filed Oct. 16, 1989, Ser. No. 421,573

Claims priority, application Switzerland, Nov. 15, 1988, 4224/88

Int. Cl.[5] C07D *309/38*

U.S. Cl. 549—294 3 Claims

1. An α-pyrone of formula I



(I)

wherein R^1 is chloro or bromo and R^2 is hydrogen, chloro or bromo.

5,004,815

METHOD FOR SYNTHESIZING β-LACTONES AND ALKENES

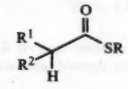
Rick L. Danheiser, Watertown, and James S. Nowick, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 26, 1989, Ser. No. 343,909

Int. Cl.[5] C07D *305/12*

U.S. Cl. 549—328 24 Claims

1. A method for producing a β-lactone comprising: combining a thiol ester having the general formula:



wherein R_1 and R_2 are selected from the group consisting of: H, alkyl, aryl, alkenyl and alkynyl groups; and wherein R is selected from the group consisting of alkyl and aryl groups; with a ketone or aldehyde, a base and a solvent under conditions sufficient to cause addition of the thiol ester to the ketone or aldehyde to form an adduct, and subsequent cyclization of the adduct to form the corresponding β-lactone.

5,004,816

AMINOPYRROLE INTERMEDIATES FOR FUNGICIDES

Tatsuya Mori; Tadashi Ohsumi; Shigeo Nakamura; Kiyoto Maeda; Sumio Nishida, and Hirotaka Takano, all of Hyogo, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

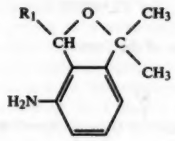
Division of Ser. No. 259,283, Oct. 18, 1988, Pat. No. 4,877,441. This application Jul. 20, 1989, Ser. No. 382,854

Claims priority, application Japan, Nov. 6, 1987, 62-281563; Nov. 6, 1987, 62-281564; Nov. 6, 1987, 62-281565; Jul. 15, 1988, 63-177751; Jul. 29, 1988, 63-191919; Jul. 29, 1988, 63-191920; Aug. 2, 1988, 63-193598

Int. Cl.[5] C07D *307/81*

U.S. Cl. 549—462 1 Claim

1. A substituted 4-amino-2-oxaindan having the formula:



wherein R_1 stands for a methyl or ethyl group.

5,004,817

POLYOXYALKYLENE-ETHER DERIVATIVES HAVING ORGANIC ACID END-GROUPS, THEIR ALKYL ETHERS AND THEIR ALKALI METAL AND ALKALINE-EARTH METAL SALTS

Catia Bastioli, Novara; Salvatore Garlisi, Vercelli; Dario Fornara, Novara, and Vittorio Bellotti, Fontaneto D'Agogna, all of Italy, assignors to Montefibre, S.p.A., Milan, Italy

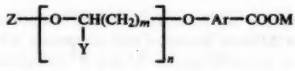
Filed Feb. 27, 1989, Ser. No. 315,568

Claims priority, application Italy, Feb. 29, 1988, 19576 A/88

Int. Cl.[5] C07D *303/12*; C07C *65/21*

U.S. Cl. 549—557 9 Claims

1. Compounds having the formula (I):



(I)

wherein:

M is an alkali or alkaline-earth metal of a C_1–C_{18} alkyl group;

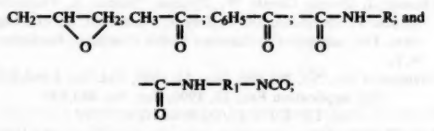
Ar is a simple or condensed aromatic ring having from 6 to 14 carbon atoms, optionally substituted with halogen atoms, C_1–C_8 alkyl, C_1–C_8 alkoxy, nitro groups; or Ar represents two or more aromatic nuclei bound either by a simple bond or by an —O—, —S—, —SO_2—, —SO—, —CO—, —CS—, or —NH— group;

Y is H or CH_3;

m is 1 when Y=—CH_3, or an integer from 1 to 5, including both values, when Y=—CH_3, or an integer from 1 to 5, including both values, when Y=H;

n is a number ranging from 20 to 500 including both values; and

Z is selected from the class consisting of H; a C_1–C_{18} alkyl, benzyl; allyl;



wherein R is a non-substituted phenyl group or a phenyl group substituted with halogen atoms or a C_{10}–C_{40} alkyl group; and R_1 is a non-substituted phenylene or a phenylene substituted with halogen atoms or a C_{10}–C_{40} alkylene group.

5,004,818

METHOD FOR PREPARATION OF NEPHRITOGENOSIDE

Seiichi Shibata, 40-11, Takadanobaba 4-chome, Shinjuku-ku, Tokyo, Japan

Filed Jul. 18, 1989, Ser. No. 381,493

Claims priority, application Japan, Jul. 21, 1988, 63-180378

Int. Cl.[5] C07K *9/00*

U.S. Cl. 530—322 10 Claims

1. A method for preparation of nephritogenoside, which comprises:

(a) treating nephritogenoside-containing animal organ tissue containing many microvessels with a nonionic surface active agent in an EDTA containing physiological salt solution;

(b) washing the precipitates thus obtained in a physiological salt solution and water in succession to remove said nonionic surface active agent, EDTA, and salt components;

(c) digesting the washed precipitates with trypsin;

(d) centrifuging the digested liquid to recover the supernatant liquid; and

(e) subjecting the supernatant liquid to a chromatography treatment to separate nephritogenoside.

5,004,819

PREPARATION OF 1-AMINO-2-BROMO-4-HYDROXYANTHRAQUINONE

Gerhard Epple, Weisenheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

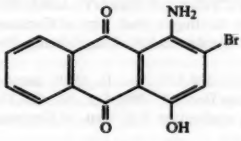
Filed Nov. 17, 1989, Ser. No. 437,660

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1988, 3841988

Int. Cl.[5] C07C *97/24*

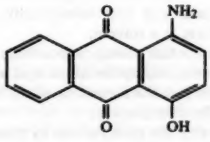
U.S. Cl. 552—244 4 Claims

1. A process for preparing 1-amino-2-bromo-4-hydroxyanthraquinone (I)



(I)

by brominating 1-amino-4-hydroxyanthraquinone (II)



(II)

in a solvent consisting essentially of an inert aprotic organic liquid.

5,004,820

PREPARATION OF CHIRAL METALLOCENE DIHALIDES

Stephen L. Buchwald, and Robert B. Grossman, both of Somerville, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

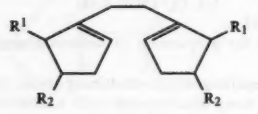
Filed Aug. 7, 1989, Ser. No. 390,062

Int. Cl.[5] C07F 00/00

U.S. Cl. 556—53 3 Claims

1. A process for preparing a chiral metallocene dihalide compound

comprising reacting a compound represented by the formula:



I

wherein both R_1 and R_2, which can be the same or different, represent a hydrocarbyl radical such as alkyl, alkenyl, aryl, alkylaryl, or arylalkyl radicals having from 1 to 20 carbon atoms, and R_2 also represents hydrogen, or R_1 and R_2 are joined together with the two carbon atoms of the cyclopentadienyl ring form a C_4–C_6 ring; with potassium hydride followed by condensation with MX_4 or its bis(tetrahydrofuran) adduct,

wherein X is a halogen selected from the group consisting of chlorine, bromine and iodine, and M represents zirconium or hafnium, except M is not zirconium when X is bromine, and recovering the resulting product.

5,004,821

PRODUCTION OF PHENYLARSINES

Hartmut Hofmann, Gottingen, Fed. Rep. of Germany, assignor to PPM Pure Metals GmbH, Langelsheim, Fed. Rep. of Germany

Division of Ser. No. 336,415, Apr. 11, 1989, abandoned. This application Dec. 27, 1989, Ser. No. 456,233

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1988, 3812180

Int. Cl.[5] C07F 9/66

U.S. Cl. 556—70 6 Claims

1. A process for the production of a phenylarsine, comprising

mixing phenylarsonic acid with substantially pure zinc in chip or tablet form in a solvent;

cooling the mixture while adding substantially pure hydrochloric acid thereto, said hydrochloric acid being added at a slow rate such that the formation of hydrogen is only slight to form the phenylarsine;

separating and drying the phenylarsine by phase separation and extraction; and

all of the foregoing steps being performed in the absence of oxygen.

5,004,822

INSECTICIDES

Michael Elliott, Harpenden; Norman F. Janes, Luton, and David A. Pulman, Harpenden, all of England, assignors to National Research Development Corporation, London, England

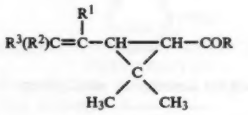
Continuation of Ser. No. 430,612, Sep. 30, 1982, abandoned, which is a continuation of Ser. No. 185,871, Sep. 10, 1980, abandoned, and a continuation of Ser. No. 185,988, Sep. 10, 1980, abandoned, each is a continuation of Ser. No. 764,895, Feb. 2, 1977, abandoned, which is a division of Ser. No. 497,056, Aug. 13, 1974, Pat. No. 4,024,163, which is a continuation-in-part of Ser. No. 363,318, May 24, 1973, abandoned. This application Feb. 19, 1987, Ser. No. 16,289

Claims priority, application United Kingdom, Dec. 21, 1971, 59184/72; May 25, 1972, 24809/72; May 25, 1972, 24810/72; Jun. 30, 1972, 30838/72; Apr. 30, 1973, 20539/73

Int. Cl.[5] C07F 1/10

U.S. Cl. 556—115 12 Claims

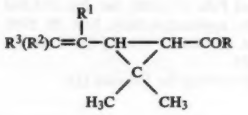
1. A single isomer of the formula



II

having 1R,cis configuration, wherein R^1 represents hydrogen, R^2 and R^3 each represent fluorine or each represent chlorine or each represent bromine and R represents OH, Cl, lower alkoxy or O^-M^+ where M^+ is an alkali metal, silver or triethylammonium ion.

4. A mixture of isomers of a compound of the formula:



II

said mixture comprises the 1R,cis isomer of said compound and at least one other different isomer of said compound, wherein R^1 is hydrogen or a methyl group, R^2 and R^3 independently represent a halogeno group with the proviso that R^2 and R^3 do not both represent chlorine in a racemic mixture, and R represents OH, Cl, lower alkoxy or O^-M^+ where M^+ is an alkali metal, silver or triethylammonium ion.

5,004,823

LOW PRESSURE RHODIUM CATALYZED HYDROFORMYLATION OF OLEFINS

Thomas J. Devon; Gerald W. Phillips; Thomas A. Puckette; Jerome L. Stavinoha, and Jeffrey J. Vanderbilt, all of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

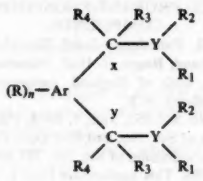
Division of Ser. No. 288,596, Dec. 22, 1988, Pat. No. 4,960,949. This application Feb. 23, 1990, Ser. No. 483,839

Int. Cl.[5] C07F 15/00, 9/66, 9/90, 9/94

U.S. Cl. 556—136 4 Claims

1. The catalyst comprising rhodium complexed with:

(a) a ligand of the formula



wherein

Ar is selected from aromatic ring compounds having 6 up to 14 carbon atoms;

the x bonds and the y bonds are attached to adjacent carbon atoms on the ring structure;

each R, when present as a substituent, is independently selected from alkyl, alkoxy, aryloxy, aryl, aralkyl, alkaryl, alkoxyalkyl, cycloaliphatic, halogen (except Cl, Br or I on the aromatic nucleus on the carbon atom adjacent to the carbon atoms bearing the x and/or y bonds), alkanoyl, alkanoyloxy, alkoxycarbonyl, formyl, carboxylate moieties, sulfonic acid derivatives, or amino moieties;

n is a whole number in the range of 0–4 wherein Ar is phenyl; 0–6 wherein Ar is naphthyl; and 0–8 where Ar is phenanthryl or anthracenyl;

each R_1 and R_2 is independently selected from alkyl, aryl, aralkyl, alkaryl, cycloaliphatic radicals and substituted derivatives thereof;

each R_3 and R_4 is independently selected from hydrogen and the R_1 substituents;

each of the above alkyl groups or moieties is straight or branched chain of 1–20 carbons, preferably 1–8 carbons;

each aryl group contains 6–10 ring carbons;

each cycloaliphatic group contains from 4–8 ring carbons; and

each Y is independently selected from elements P, As, Sb and Bi;

in a molar ratio of ligand/Rh of about 1/1;

(b) H in an atomic ratio of H/Rh of about 1/1; and

(c) carbon monoxide in a molar ratio of CO/Rh of about 2/1.

5,004,824

FLUORINE-CONTAINING ORGANOSILICON COMPOUND

Akio Takaoka, and Hiroshi Inomata, both of Takasaki, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

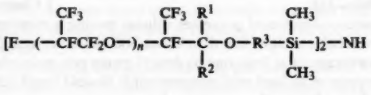
Filed Jun. 28, 1989, Ser. No. 372,528

Claims priority, application Japan, Jun. 29, 1988, 63-162172

Int. Cl.[5] C07F 7/10

U.S. Cl. 556—412 **2 Claims**

1. A fluorine-containing organosilicon compound represented by Formula (I):



(I)

wherein n represents an integer from 1 to 4, R^1 and R^2 may be the same or different and each represent a hydrogen atom or a fluorine atom, and R^3 represents an alkylene group having 1 to 6 carbon atoms.

5,004,825

PROCESS FOR PREPARING DI(FLUOROALKYL CONTAINING GROUP-SUBSTITUTED ALKYL) PHOSPHATE SALT

Tutomu Yoshida, and Shigeharu Iida, both of Osaka, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 184,673, Apr. 22, 1988, abandoned. This application Jul. 18, 1989, Ser. No. 381,324

Claims priority, application Japan, Apr. 22, 1987, 62-100868

Int. Cl.[5] C07F 9/02

U.S. Cl. 558—131 **10 Claims**

1. A process for preparing a di(fluoroalkyl containing group-substituted alkyl) phosphate salt of the formula:

$$[R_f\text{—}A^1_k\text{—}(CH_2)_m\text{—}O]_2PO\text{—}OA^2 \quad (I)$$

which comprises hydrolyzing a mon-sec. or tert.-alkyl or alkenyl di(fluoroalkyl containing group-substituted alkyl) phosphate of the formula:

$$[R_f\text{—}A^1_k\text{—}(CH_2)_m\text{—}O]_2PO\text{—}OR \quad (II)$$

with a base selected from the group consisting of an alkali hydroxide, an ammonium hydroxide and an amine, at a temperature of 80° to 100° C., the base being used in an amount of 1 to 10 equivalents per mole of the alkyl or alkenyl di(fluoroalkyl containing group-substituted alkyl) phosphate (II), wherein

each R_f is independently a perfluoroalkyl group or ω-hydroperfluoroalkyl group having 3 to 21 carbon atoms and may be linear, branched, cyclic or a combination thereof,

each A^1 is independently a divalent group which is selected from the group consisting of —COO—, SO_2—, —O—, $—(CH_2)_3—O—$, —S—, $—(CH_2)_p—NR'—$, $—CH_2C-H(OR')—$, —CO—NR′— or $—SO_2—NR'—$in which R′ is a hydrogen or an alkyl group having 1 to 5 carbon atoms, and p is a integer of 1 to 6,

A^2 is an alkaline metal or an ammonium group which may be substituted with an alkyl and/or hydroxyalkyl group,

R is a secondary or tertiary alkyl or alkenyl group having 3 to 9 carbon atoms,

k is 0 to 1, and

m is an integer of 1 to 4.

9. A process for preparing a di(fluoroalkyl containing group-substituted alkyl) phosphate salt of formula (I)

$$[R_f\text{—}A^1_k\text{—}(CH_2)_m\text{—}O]_2PO\text{—}OA^2 \quad (I)$$

which comprises:

reacting a secondary or tertiary alcohol with phosphoryl trihalide in a molar ratio of the secondary or tertiary alcohol to the phosphoryl trihalide of 0.9:1 to 1:1 at a temperature of room temperature to 70° C. to produce a phosphoryl monoalkoxide dihalide,

reacting the phosphoryl monoalkoxide dihalide with a fluoroalkyl containing group-substituted alcohol in a molar ratio of said dihalide to the fluoroalkyl containing group-substituted alcohol of 1:2 to 1.2:2 at a temperature of 80° to 100° C. to produce a mono sec.- or tert.-alkyl di(fluoroalkyl containing group-substituted alkyl) phosphate of formula (II)

$$[R_f\text{—}A^1_k\text{—}(CH_2)_m\text{—}O]_2PO\text{—}OR \quad (II)$$

and

hydrolyzing the mono-sec.- or tert.-alkyl di(fluoroalkyl containing group-substituted alkyl) phosphate of formula (II) with a base at a temperature of 80° to 100° C., the base being used in an amount of 1 to 10 equivalents per mole of the alkyl or alkenyl di(fluoroalkyl containing group-substituted alkyl) phosphate of formula (II),

wherein each R_f is independently a perfluoroalkyl group or ω-hydroperfluoroalkyl group having 3 to 21 carbon atoms

and may be linear, branched, cyclic or a combination thereof,

each A^1 is independently a divalent group which is selected from the group consisting of —COO—, SO_2—, —O—, —$(CH_2)_3$—O—, —S—, —$(CH_2)_p$—NR′—, —CH_2-CH(OR′)—, —CO—NR′— or —SO_2—NR′— in which R′ is a hydrogen or an alkyl group having 1 to 5 carbon atoms, and p is a integer of 1 to 6,

A^2 is an alkaline metal or an ammonium group which may be substituted with an alkyl and/or hydroxyalkyl group,

R is a secondary or tertiary aikyl or alkenyl group having 3 to 9 carbon atoms,

k is 0 to 1, and

m is an integer of 1 to 4.

10. A process for preparing a di(fluoroalkyl containing group-substituted alkyl) phosphate salt of the formula:

$$[R_f—A^1_k—(CH_2)_m—O]_2PO—OA^2 \quad (I)$$

which comprises reacting a secondary or tertiary alcohol of the formula:

$$ROH \quad (V)$$

with a phosphoryl trihalide of the formula:

$$POX_3 \quad (VI)$$

in a molar ratio of the secondary or tertiary alcohol to the phosphoryl trihalide of 0.9:1 to 1:1 at a temperature of room temperature to 70° C. to produce a phosphoryl monoalkoxide dihalide of the formula:

$$RO—POX_2 \quad (IV)$$

and reacting the phosphoryl monoalkoxide dihalide of the formula (IV) with a fluoroalkyl containing group-substituted alcohol of the formula:

$$R_f—A^1_k—(CH_2)_m—OH \quad (III)$$

in a molar ratio of said dihalide to the fluoroalkyl containing group-substituted alcohol of 1:2 to 1.2:2 at a temperature of 80° to 100° C. to produce an alkyl ester of di(fluoroalkyl containing group-substituted alkyl) phosphate of the formula:

$$[R_f—A^1_k—(CH_2)_m—O]_2PO—OR \quad (II)$$

and then hydrolyzing the alkyl ester of di(fluoroalkyl containing group-substituted alkyl) phosphate of the formula (II) with a base selected from the group consisting of an alkali hydroxide, an ammonium hydroxide and an amine, at a temperature of 80° to 100° C., the base being used in an amount of 1 to 10 equivalent per mole of the alkyl or alkenyl di(fluoroalkyl containing group-substituted alkyl) phosphate of formula (II), wherein each R_f is independently a perfluoroalkyl group or ω-hydroperfluoroalkyl group having 3 to 21 carbon atoms,

each A^1 is independently a divalent group which is selected from the group consisting of —COO—, SO_2—, —O—, —$(CH_2)_3$—O—, —S—, —$(CH_2)_p$—NR′—, —CH_2-CH(OR′)—, —CO—NR′— or —SO_2—NR′— in which R′ is a hydrogen or an alkyl group having 1 to 5 carbon atoms, and p is a integer of 1 to 6,

A^2 is an alkaline metal or an ammonium group which optionally have an alkyl and/or hydroxyalkyl substituent,

R is a secondary or tertiary alkyl or alkenyl group having 3 to 9 carbons,

each X is independently halogen,

k is 0 to 1, and

m is an integer of 1 to 4.

5,004,826

SUBSTITUTED PROPANE-PHOSPHONOUS ACID COMPOUNDS

John G. Dingwall, Pantaleon; Josef Ehrenfreund, Allschwil, both of Switzerland; Roger G. Hall, Manchester, and James Jack, Cheshire, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

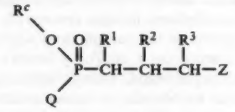
Division of Ser. No. 203,851, Jun. 7, 1988, Pat. No. 4,908,465, which is a division of Ser. No. 940,836, Dec. 12, 1986, Pat. No. 4,772,738, which is a division of Ser. No. 787,300, Oct. 15, 1985, Pat. No. 4,656,298. This application Dec. 1, 1989, Ser. No. 444,466

Claims priority, application United Kingdom, Dec. 10, 1984, 8425872

Int. Cl.[5] **C07F** *9/30, 9/32*

U.S. Cl. 558—169 **1 Claim**

1. A compound having the formula II



(II)

in which one of the groups R^1, R^2 and R^3 represents hydrogen, C_1–C_8alkyl, C_3–C_6-cycloalkyl, phenyl either unsubstituted or substituted by halogen, C_1–C_4alkyl, C_1–C_4alkoxy and/or trifluoromethyl, or phenyl-C_1–C_4alkyl either unsubstituted or substituted in the phenyl moiety by halogen, C_1–C_4alkyl, C_1–C_4alkoxy and/or trifluoromethyl, and the other two are hydrogen, Q denotes a group having the formula

—C(C_1–C_4alkyl)(OR^a)OR^b,

in which R^a and R^b are each C_1–C_4alkyl, R^c is C_1–C_4alkyl and Z denotes —NH_2, or a pharmaceutically acceptable salt thereof.

5,004,827

CATALYTIC VAPOR PHASE PROCESS FOR PRODUCING DIHYDROCARBYL CARBONATES

Gerald L. Curnutt, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 871,725, Jun. 6, 1986, abandoned. This application Sep. 17, 1987, Ser. No. 97,882

Int. Cl.[5] **C07C** *68/00, 69/96*

U.S. Cl. 558—277 **13 Claims**

1. A process comprising contacting oxygen, carbon monoxide and an alkanol, which can be vaporized under the reaction conditions, in the vapor phase, in the presence of a heterogeneous catalyst which consists essentially of a metal halide or a mixed metal halide impregnated on activated carbon under reaction conditions sufficient to produce a dihydrocarbyl carbonate.

5,004,828

HYDROXY-FUNCTIONAL POLYESTER DILUENTS AS ADDITIVES IN COATING COMPOSITIONS

John Mathai, Chicago, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Apr. 27, 1987, Ser. No. 43,051

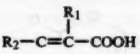
Int. Cl.[5] **C07C** *69/52*

U.S. Cl. 560—224 **2 Claims**

1. A hydroxy-functional polyester diluent having a number average molecular weight less than about 500 characterized as having an average of at least one hydroxyl group per molecule and an average of at least one polymerizable double bond per molecule derived from the reaction of:

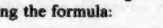
(a) at least one triol having a molecular weight less than about 200,

(b) at least one low molecular weight unsaturated monocarboxylic acid having the formula:



wherein R_1 is either hydrogen or an alkyl group of 1 to 3 carbon atoms and R_2 is an aliphatic group of 1 to 4 carbon atoms or an aryl group, and

(c) at least one low molecular weight saturated monocarboxylic acid having the formula:



wherein R is hydrogen or a branched alkyl or straight chain alkyl or cyclic alkyl of 1 to 6 carbon atoms;

said triol being present in a stoichiometric amount to provide excess hydroxyl groups and said unsaturated monocarboxylic acid being present in amounts sufficient to provide at least one ethylenically unsaturated group for each molecule of triol.

5,004,829

METHOD OF PREPARING TRIFLUOROMETHANESULFONIC ACID ANHYDRIDE

Minoru Aramaki, Tokyo; Takashi Suenaga; Hiroaki Sakaguchi, and Takanori Hamana, both of Ube, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Apr. 9, 1990, Ser. No. 506,206

Claims priority, application Japan, Apr. 10, 1989, 1-90375

Int. Cl.[5] B01D *3/34*; C07C *303/00, 303/44*

U.S. Cl. 562—113 **17 Claims**

1. A method of preparing trifluoromethanesulfonic acid anhydride, comprising the steps of:

reacting trifluoromethanesulfonic acid with phosphorus pentaoxide and removing trifluoromethanesulfonic acid anhydride formed by the reaction by distillation while leaving a residue of the distillation;

adding an aqueous solution of phosphoric acid to the residue of said distillation so as to obtain a fluidic mixture; and

subjecting said fluidic mixture to distillation to thereby recover unreacted trifluoromethanesulfonic acid contained in said residue.

5,004,830

PROCESS FOR OXIDATION OF ALKYL AROMATIC COMPOUNDS

Chang M. Park, and Wayne P. Schammel, both of Naperville, Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Nov. 29, 1989, Ser. No. 443,556

Int. Cl.[5] C07C *51/215*

U.S. Cl. 562—413 **6 Claims**

1. A batch, semi-continuous or continuous liquid phase process for production of aromatic polycarboxylic acid by oxidation in at least two reactors of an alkyl aromatic hydrocarbon wherein the alkyl group of said alkyl aromatic hydrocarbon contains from 1 to 5 carbon atoms and the number of alkyl groups is from 2 to 4, in the presence of a bromine-cobalt-manganese catalyst, which process comprises:

(a) preparing in a first reactor a liquid reaction mixture containing water, an aliphatic C_2–C_6 monocarboxylic acid and said alkyl aromatic hydrocarbon, wherein water concentration is in the range of from about 0 to about 15 wt.%, wherein mole ratio of bromine to cobalt plus manganese of said catalyst is in the range of from about 0.25 to about 1.2,

(b) injecting an oxygen-containing gas into said first reactor at a rate of from about 1.5 to about 2.7 moles of oxygen per alkyl group,

(c) oxidizing in said first reactor said alkyl aromatic hydrocarbon in an exothermic reaction at a temperature of from about 200° F. to about 350° F. at a reactor pressure of from about 150 psig to about 500 psig, and oxygen partial pressure is at least 1.5 psia, to prepare mono-acids and mono-aldehydes,

(d) controlling said temperature and said pressure within said ranges by means of a liquid phase heat exchanger, wherein a portion of said liquid reaction mixture is removed from said first reactor, cooled in said heat exchanger and returned to said first reactor as a liquid,

(e) transferring a portion of first reactor liquid phase to a second oxidation reactor, wherein water concentration is in the range of from about 0 to about 20 wt.%, wherein mole ratio of bromine to cobalt plus manganese of said catalyst is in the range of from about 0.25 to about 1.2, 1

(f) injecting an oxygen-containing gas into said second reactor at a mole ratio of from about 1.5 to about 2.7 moles of oxygen per alkyl group,

(g) oxidizing said portion of first reactor liquid phase in said second oxidation reactor and in succeeding oxidation reactors necessary to complete said oxidation of said alkyl aromatic hydrocarbon at a temperature within the range of from about 275° F. to about 450° F. pressure within the range of from about 75 psig. to about 450 psig and oxygen partial pressure of at least 1.5 psia, wherein temperature and pressure in said second reactor are controlled by means of a liquid phase heat exchanger wherein a portion of the reaction mixture in said second reactor is removed from said second reactor, cooled in said heat exchanger, and returned to said second reactor as a liquid,

(h) recovering said aromatic polycarboxylic acid as product.

5,004,831

RECOVERY OF HUMIC ACIDS

Johannes Dekker, Pretoria, and Izak J. Cronje, Verwoerdburg, both of South Africa, assignors to National Energy Council, Pretoria, South Africa

Filed Nov. 16, 1989, Ser. No. 437,174

Claims priority, application South Africa, Nov. 16, 1988, 88/8555

Int. Cl.[5] C07C *65/01*

U.S. Cl. 562—475 **5 Claims**

1. A method of recovering humic acid from oxidized coal including the steps of mixing the material with aqueous alkali, heating the mixture to a temperature above 100° C. and below 180° C. under sufficient pressure to prevent evaporation of the water, and maintaining the elevated temperature for a time sufficient to extract a substantial amount of the available humic acids from the material.

5,004,832

PREPARING ALPHA-ARYLALKANOIC ACIDS

Graziano Castaldi, Briona, and Claudio Giordano, Vicenza, both of Italy, assignors to Zambon S.p.A., Vicenza, Italy

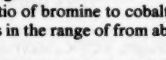
Division of Ser. No. 891,348, Jul. 31, 1986, Pat. No. 4,824,970. This application Feb. 6, 1989, Ser. No. 306,755

Claims priority, application Italy, Jul. 31, 1985, 21803 A/85

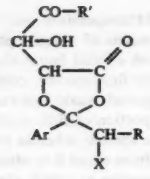
Int. Cl.[5] C07C *63/36, 63/04*; C07D *333/22*

U.S. Cl. 562—490 **2 Claims**

1. A process for preparing alpha-arylalkanoic acids of formula



in which Ar represents 4-isobutyl-phenyl, 3-phenoxy-phenyl, 2-fluoro-4-diphenylyl, 4-(2-thienylcarbonyl)-phenyl, 6-methoxy-2-naphthyl, 5-bromo-6-methoxy-2naphthyl, 6-hydroxy-2-naphthyl, 4-chloro-phenyl or 4-difluoromethoxy-phenyl, and R represents a C_1–C_4 alkyl or their immediate precursors, comprising heating a compound of formula



wherein

Ar represents 4-isobutyl-phenyl, 3-phenoxy-phenyl, 2-fluoro-4-diphenylyl, 4-(2-thienylcarbonyl)-phenyl, 6-methoxy-2-naphthyl, 5-bromo-6-methoxy-2-naphthyl, 6-hydroxy-2-naphthyl, 4-chloro-phenyl or 4-difluoromethoxy-phenyl;

R represents a C_1–C_4 alkyl;

R′ represents a hydroxyl or an alkoxy C_1–C_4;

X represents a chlorine, bromine or iodine atom,

in a protic polar solvent or in an aprotic dipolar solvent in the presence of a substance having a high dielectric constant, in a neutral or slightly alkaline environment.

5,004,833

KS-501 DERIVATIVES

Toru Yasuzawa, Sakai; Satoshi Nakanishi, Machida; Chikara Murakata, Asaka, all of Japan; Hiroshi Kase, Eastham, England; Hiroshi Sano, and Koji Yamada, both of Machida, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

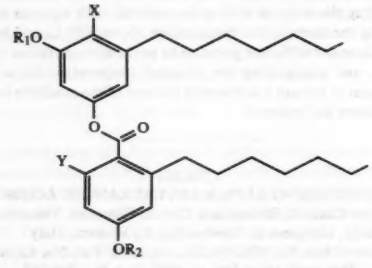
Filed Sep. 15, 1989, Ser. No. 408,192

Claims priority, application Japan, Sep. 21, 1988, 63-237316; Sep. 21, 1988, 63-237317

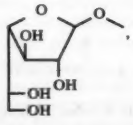
Int. Cl.[5] C07H *15/00*; A61K *31/715*

U.S. Cl. 536—18.2 **4 Claims**

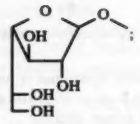
1. A compound represented by the formula



wherein X represents a hydrogen atom or $COOR_3$ wherein R_3 represents an alkyl group having 1 to 4 carbon atoms, Y represents hydroxy or



and R_1 and R_2 are the same or different and represent a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, provided that when R_1, R_2 and X are simultaneously hydrogen atoms, Y does not represent



or a pharmaceutically acceptable acid addition salt thereof.

5,004,834

PREPARATION OF POLYAMIDES FROM UNSTABLE DIAMINES

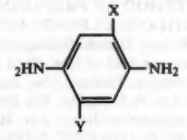
Robert S. Irwin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 5, 1990, Ser. No. 505,342

Int. Cl.[5] C07C *231/02*

U.S. Cl. 564—142 **4 Claims**

1. A process for preparing high molecular weight polyamides comprising forming a slurry of the dihydrochloride of



where X is Cl, Br or lower alkyl and Y is Cl, Br, lower alkyl or hydrogen in a solvent for the diamine, reacting the dihydrochloride with a tertiary amine in an amount at least equivalent to the HCl of the dihydrochloride to form free diamine in solution and treating the solution with an aromatic diacid chloride to form the polyamide.

5,004,835

SUBSTITUTED DICARBOXYLIC ACID-BIS(3,5-DICARBAMOYL-2,4,6-TRIIODOANILIDES), PROCESS FOR THEIR PRODUCTION AS WELL AS X-RAY CONTRAST MEDIA CONTAINING THEM

Peter Blaszkiewicz, and Ulrich Speck, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

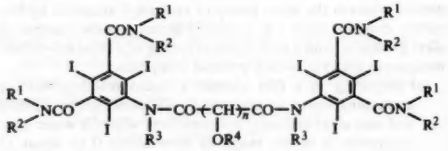
Filed Nov. 15, 1988, Ser. No. 271,464

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1987, 3739098

Int. Cl.[5] C07C *63/24, 103/78*

U.S. Cl. 564—153 **17 Claims**

1. A substituted dicarboxylic acid-bis(3,5-dicarbamoyl-2,4,6-triiodoanilide), of the formula



wherein

R^1 is hydrogen, a C_1–C_4 alkyl or R^2, wherein R^1 and R^2 may be the same or different,

R^2 is a straight-chain or branched-chain C_2–C_8 monohydroxyalkyl or polyhydroxyalkyl,

R^3 is a hydrogen atom, C_1–C_4 alkyl or R^2, wherein R^2 and R^3 are the same or different,

R^4 is a hydrogen atom, C_1–C_4 alkyl, and

n=1 or 2.

5,004,836

AROMATIC POLYETHERS CONTAINING KETO GROUPS IN SIDE CHAINS

Hans-Rytger Kricheldorf, Hamburg; Ulrich Delius, Ahrensburg, and Rolf Wehrmann, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

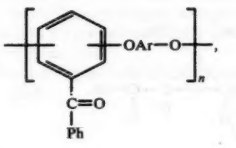
Filed Nov. 13, 1989, Ser. No. 435,045

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1988, 3838644

Int. Cl.[5] C07C *49/213*

U.S. Cl. 568—333 3 Claims

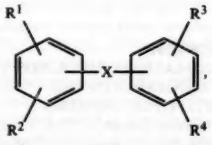
1. Aromatic polyethers containing keto groups in the side chains and corresponding to formula (I)



(I)

wherein

Ar stands for C_6–C_{30}-aryl group optionally substituted with C_1–C_4 alkyl, C_6–C_{14}-aryl, C_7–C_{24}-aryl, C_7–C_{24}-alkaryl, or a group of the formula (Ia)



(Ia)

wherein

X denotes a chemical bond, an oxygen atom, a sulfur atom, a sulphone group, a carbonyl group, or a C_3–C_{20}-alkylene group, and R^1 to R^4 denote, independently of one another, hydrogen, C_1–C_{20}-alkyl, methyl, C_6–C_{14}-aryl or halogen, and

Ph stands for phenyl optionally substituted with X–C_1–C_4-alkyl or X–C_6–C_{14} aryl, wherein X stands for oxygen or sulfur and

n stands for an integer from 3 to 250.

5,004,837

PROCESS FOR PREPARING A CYCLOALKANONE AND/OR CYCLOALKANOL

Henricus A. C. Baur, Herten, and Ubaldus F. Kragten, Beek, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Oct. 20, 1989, Ser. No. 424,706

Claims priority, application Netherlands, Oct. 21, 1988, 8802592

Int. Cl.[5] C07D *45/53*

U.S. Cl. 568—342 8 Claims

1. Process for preparing a cycloalkanone and/or cycloalkanol by oxidation of a cycloalkane with 5–12 carbon atoms using oxygen to form a cycloalkylhydroperoxide, followed by a decomposition of the cycloalkylhydroperoxide in the presence of an organic metal complex, characterized in that the decomposition of the cycloalkylhydroperoxide is carried out in the presence of a phthalocyanine or porphyrin metal complex immobilized on a carrier material.

5,004,838

INOSOSE DERIVATIVES, PRODUCTION AND USE THEREOF

Satoshi Horii, and Hiroshi Fukase, both of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

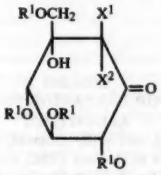
Division of Ser. No. 90,974, Aug. 31, 1987, Pat. No. 4,898,986. This application Sep. 29, 1989, Ser. No. 414,247

Claims priority, application Japan, Sep. 9, 1986, 61-212952; Nov. 5, 1986, 61-263462; Jan. 6, 1987, 62-779

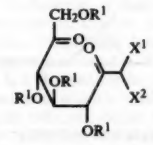
Int. Cl.[5] C07C *45/45*

U.S. Cl. 568—347 1 Claim

1. A process of preparing an inosose compound represented by the formula



wherein X^1 and X^2 are both halogen; or X^1 is —SQ^1 and X^2 is —SQ^2 (each of Q^1 and Q^2 is lower alkyl or Q^1 and Q^2 may form lower alkylene) and R^1 is a protective group for hydroxyl, which comprises treating a compound represented by the formula



wherein X^1 and X^2 are both halogen; or X^1 is —SQ^1 and X^2 is —SQ^2 (each of Q^1 and Q^2 is lower alkyl or Q^1 and Q^2 may form lower alkylene) and R^1 is a protective group for hydroxyl, with a base or silica gel at about −78° C. to the boiling point of a solvent included therewith for about 1 to 18 hours.

5,004,839

PREPARATION OF UNSATURATED KETONES FROM ACETONE AND PARAFORMALDEHYDE (II)

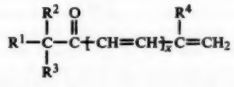
Joseph Pugach, Monroeville Borough, and Jeffrey S. Salek, Oakdale Borough, both of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 425,269, Oct. 23, 1989, abandoned. This application Apr. 13, 1990, Ser. No. 508,454

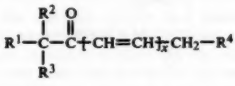
Int. Cl.[5] C07C *45/45*

U.S. Cl. 568—390 31 Claims

1. Method of making a compound of the formula



comprising reacting a ketone of the formula



with paraformaldehyde in the presence of a secondary amine catalyst, a halogen acid, and a solid catalyst selected from the

group consisting of nonsoluble oxides of elements of Groups IB, IIIA, IVA, IVB, VA, VB, VIB and VIII of the periodic table, where R^1, R^2, R^3 and R^4 are independently selected from hydrogen, alkyl and aromatic groups having 1 to about 15 carbon atoms including unsaturated groups provided that if both R^1 and R^2 are unsaturated, they should have a total of at least 4 carbon atoms and also provided that R^1, R^2, R^3 and R^4 may form parts of the same carbon or heterocyclic ring which may have substitutions, the total number of carbon atoms thereof being up to about 30, and x is 0 or 1.

5,004,840

PROCESS FOR PREPARING SEMI-CARONIC ALDEHYDES

Alain Krief, Wepion, and Willy Dumont, Salet-Anhee, both of Belgium, assignors to Roussel Uclaf, Paris, France

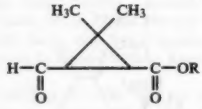
Filed Dec. 9, 1988, Ser. No. 282,382

Claims priority, application France, Dec. 11, 1987, 87 17296

Int. Cl.[5] C07C *45/58*

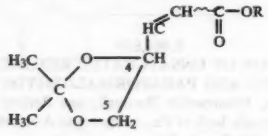
U.S. Cl. 568—486 **19 Claims**

1. A process for the preparation of compounds of the formula



I

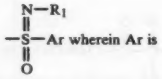
with cis or trans structure in racemic or optically active form wherein R is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms and aryl of 6 to 12 carbon atoms comprising reacting an optically active isomer, or racemate of the formula



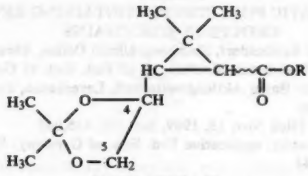
II

wherein R has the above definition and the wavy line indicates Z geometry with a gem-dimethyl cyclopropanation agent of the formula

wherein X is selected from the group consisting of $—P(Ar)_3$, $S(Ar)_2$, $Se(Ar)_2$, $—As(Ar)_2$ and

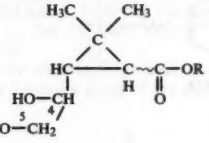


aryl and R_1 is hydrogen or alkyl of 1 to 5 carbon atoms to obtain a compound of the formula



III

wherein R has the above definition and the cyclopropane ring has the trans configuration and hydrolyzing the compound of formula III with a mineral or organic acid to obtain a compound of the formula



IV

and then cleaving the 4,5 bond under oxidizing conditions to obtain the corresponding compound of formula I.

5,004,841

ALKYLATION OF AROMATIC COMPOUNDS TO ALKYLATES ENRICHED IN THE LINEAR-SUBSTITUTED ISOMERS

Guo-shuh J. Lee; Juan M. Garces; Joseph J. Maj, all of Midland, and Stephen C. Rocke, Mt. Pleasant, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 123,741, Nov. 23, 1987, Pat. No. 4,891,448. This application Mar. 14, 1989, Ser. No. 323,530

The portion of the term of this patent subsequent to Jan. 2, 2007, has been disclaimed.

Int. Cl.[5] C07C *41/00*

U.S. Cl. 568—678 **28 Claims**

1. A process of alkylating an aromatic compound to a mixture of substituted aromatic compounds enriched in the linear alkylated isomers comprising contacting an aromatic compound with an alkylating agent having from one to eight carbon atoms in the presence of a catalyst under conditions such that a mixture of substituted aromatic compounds enriched in the linear alkylated isomers is formed, said catalyst consisting essentially of an acidic mordenite zeolite having a silica/alumina molar ratio of at least 15:1 and a crystalline structure which is determined by X-ray diffraction to possess a Symmetry Index sufficient to increase the yield of linear alkylated isomers to at least about 20 mole percent.

5,004,842

AROMATIC VINYL ETHER COMPOUNDS AND COMPOSITIONS, AND METHOD OF MAKING THE SAME

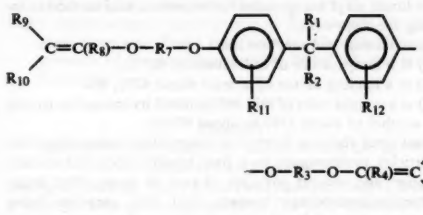
Philip T. Klemarczyk, Collinsville, and Yoshihisa Okamoto, Avon, both of Conn., assignors to Loctite Corporation, Newington, Conn.

Filed Jun. 25, 1990, Ser. No. 543,248

Int. Cl.[5] C07C *43/00*

U.S. Cl. 568—640 **12 Claims**

1. An aromatic vinyl ether of the formula:



wherein:

R_1, R_2, R_4, R_5, R_6, R_8, R_9 and R_{10} are independently selected from hydrogen, halogen, and C_1–C_8 alkyl radicals;

R_3 and R_7 are independently selected from C_1–C_8 alkylene radicals; and

R_{11} and R_{12} are independently selected from allyl and methallyl.

5,004,843

PROCESS FOR PRODUCING ALLYLIC ALCOHOLS

Mitsuhisa Tamura; Gohu Suzukamo, and Ken-ichi Hirose, all of Osaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

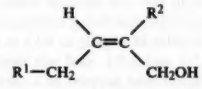
Continuation of Ser. No. 338,546, Apr. 17, 1989, abandoned, which is a continuation of Ser. No. 91,308, Aug. 28, 1987, abandoned, which is a continuation of Ser. No. 430,511, Sep. 30, 1982, abandoned, which is a continuation of Ser. No. 209,143, Nov. 21, 1980, abandoned. This application May 29, 1990, Ser. No. 529,730

Claims priority, application Japan, Nov. 22, 1979, 54-151877; Nov. 22, 1979, 54-151878; Apr. 8, 1980, 55-46347; Jun. 13, 1980, 55-80413; Jun. 25, 1980, 55-86873

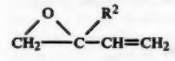
Int. Cl.[5] C07C *41/00, 33/34, 33/28, 35/06*

U.S. Cl. 568—670 **15 Claims**

1. A process for preparing 1,4 adducts exclusively and regioselectively which are predominantly Z-substituted allylic alcohols of the formula:



wherein R^1 is a straight or branched C_2–C_{25} alkyl or C_3–C_{25} cycloalkyl group optionally bearing at least one substituent selected from the group consisting of phenyl, naphthyl, lower alkoxy and alkylenedioxy and R^2 is a hydrogen atom or a methyl group, which comprises reacting 1 mole of vinyl epoxide of the formula:



wherein R^2 is as defined above with 0.1 to 10 moles of an organolithium compound of the formula:

$$R^1—Li$$

wherein R^1 is as defined in an inert solvent at a temperature of −78° C. to the reflux temperature of the reaction mixture.

5,004,844

PROCESS FOR THE REDUCTION OF CARBONYL COMPOUNDS

Petrus W. N. M. Van Leeuwen, and Cornelis F. Roobeek, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 28, 1989, Ser. No. 372,577

Claims priority, application United Kingdom, Jun. 28, 1988, 8815328

Int. Cl.[5] C07C *29/14, 29/132*

U.S. Cl. 568—880 **25 Claims**

1. A process for the preparation of alcohols, which comprises contacting and reacting hydrogen with a carbonyl reactant comprising one or more compounds selected from the group consisting of aldehydes of the formula R^3CHO and ketones of the formula R^3COR^4, wherein R^3 and R^4 each is independently selected from the group consisting of substituted and unsubstituted alkyl, alkenyl, cycloalkyl and cycloalkenyl moieties having from 1 to about 10 carbon atoms or a phenyl group, in the presence of a catalyst system comprising a platinum compound, an acid having a pKa in the range of from about 2 to about 10.5 and a phosphorus compound of the formula R^1R^2POH, wherein R^1 and R^2 each independently represents a C_1 to C_{10} alkyl group or a phenyl group, at a temperature in the range from about 20 to about 150° C. and at a pressure in the range from about 1 to about 100 bar.

5,004,845

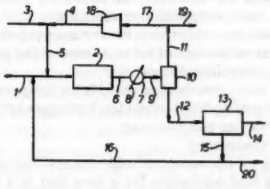
HYDROGENATION OF ALDEHYDES

Michael W. Bradley, Marton; Norman Harris, Norton, and Keith Turner, Fairfield, all of England, assignors to Davy McKee (London) Limited, London, England

Continuation of Ser. No. 874,805, Jun. 13, 1986, abandoned, which is a continuation of Ser. No. 659,904, Oct. 11, 1984, abandoned, which is a continuation-in-part of Ser. No. 409,933, Aug. 20, 1982, abandoned, which is a continuation-in-part of Ser. No. 294,519, Aug. 20, 1981, abandoned. This application Jun. 27, 1988, Ser. No. 212,113

Int. Cl.[5] C07C *29/136, 29/14, 31/12, 31/125*

U.S. Cl. 568—885 **17 Claims**



1. In a continuous process for the production of an aliphatic alcohol containing 2 to 10 carbon atoms by catalytic hydrogenation of an aliphatic aldehyde containing 2 to 10 carbon atoms by reaction of a hydrogenation mixture containing the aldehyde and hydrogen in a catalytic aldehyde hydrogenation zone containing a charge of a hydrogenation catalyst effective for the hydrogenation of aldehydes and maintained under aldehyde hydrogenation conditions, followed by recovery of a reaction mixture containing, in addition to product alcohol, a minor amount of a by-product ester containing twice as many carbon atoms as the product alcohol, said ester being derived from an alkyl carboxylic acid containing the same number of carbon atoms as the product alcohol and from the product alcohol, the improvement comprising separating by-product ester from the reaction mixture and passing an essentially aldehyde-free vaporous mixture comprising by-product ester and hydrogen, in which mixture the vapour pressure of said by-product ester is at least about 0.05 kg/cm^2 over a catalyst consisting essentially of a reduced mixture of copper oxide and zinc oxide, in a secondary catalytic hydrogenation zone, at a temperature in the range of from about 150° C. to about 240° C.

and at a pressure in the range of from about 5 kg/cm^2 absolute up to about 50 kg/cm^2 absolute, and recovering from said secondary catalytic hydrogenation zone a reaction mixture that is substantially free from by-product ester and contains a substantially quantitative yield of further product alcohol corresponding to 2 moles of further product alcohol per mole of by-product ester treated in the secondary catalytic hydrogenation zone.

5,004,846

PROCESS FOR PRODUCING NITROBENZENES

Hiroshi Sato; Kenichi Hirose; Koichi Nagai; Hiroshi Yoshioka, and Yoshihiko Nagaoka, all of Ehime, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed May 15, 1989, Ser. No. 352,022

Claims priority, application Japan, May 18, 1988, 63-122671

Int. Cl.^{5} C07C *79/10*

U.S. Cl. 568—940 **10 Claims**

1. A process for producing nitrobenzenes which comprises nitrating benzenes in a vapor phase using nitric acid as a nitrating agent in the presence of acidic sheet clay minerals which are sheet clay minerals ion-exchanged with a member of the group selected from Al^{3+}, Ti^{4+}, Zr^{4+}, Fe^{3+}, Cr^{3+}, Bi^{3+} and La^{3+}.

6. A process for producing nitrobenzenes which comprises nitrating benzenes in a vapor phase using nitric acid as a nitrating agent in the presence of acidic composite oxides comprising oxides of metals belonging to Group IVA of Medeleefs' periodic Table and tungsten oxide, molybdenum oxide, niobium oxide or zinc oxide.

5,004,847

RECOVERY OF HEXABROMOCYCLODODECANE PARTICLES

Phillip R. Beaver, Baton Rouge, La.; Peter M. DiGiacinto, Seabrook, Tex.; Donald O. Hutchinson, and Julio J. Vega, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Dec. 27, 1989, Ser. No. 457,960

Int. Cl.^{5} C07C *23/02*

U.S. Cl. 570—186 **24 Claims**

1. A method for obtaining an improved product from a composition, said composition comprising:

(i) solid particles comprising hexabromocyclododecane;

(ii) a solvent or mixture of solvents used in the production of hexabromocyclododecane; and

(iii) one or more members selected from the group consisting essentially of dodecyl bromides, hydrogen bromide, lower alkyl bromides and bromine;

said method comprising

(1) forming an admixture of said composition and water;

(2) heating said admixture for a time and at a temperature and a pressure, which time, temperature and pressure are sufficient to remove at least a portion of said solvent from said admixture and to form agglomerates with at least a portion of said particles; and

(3) recovering from said admixture a product comprising said particles and agglomerates;

wherein said forming and said heating are effective to enhance the removal of at least a portion of said solvent and/or said one or more members so as to obtain said improved product.

5,004,848

METHOD OF ELEVATING THE MELTING POINT OF A HEXABROMOCYCLODODECANE PRODUCT

Phillip R. Beaver, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Feb. 5, 1990, Ser. No. 475,384

Int. Cl.^{5} C07C *17/12*

U.S. Cl. 570—206 **17 Claims**

1. A method for elevating the melting point of hexabromocyclododecane product obtained from a reaction mass formed by admixing bromine and cyclododecatriene in a solvent system comprising the admixture of a lower alkyl alcohol and a lower alkyl halogenated hydrocarbon, said method comprising the steps of:

(1) maintaining said reaction mass

(a) at a temperature of at least about 40° C.,

(b) at a loading factor of at least about 40%, and

(c) at a weight ratio of said halogenated hydrocarbon to said alcohol of about 3/97 to about 90/10,

at least until there is formed a composition comprising first particles predominant in a first hexabromocyclododecane isomer and second particles of one or more other hexabromocyclododecane isomers, said first particles being larger in size and heavier in mass than said second particles and said first isomer having a higher melting point than each of said one or more other isomers; and

(2) processing said composition to produce said HBCD product, said processing comprises separating said first and second particles according to size or mass so as to preferentially retain said first particles in said hexabromocyclododecane product.

5,004,849

MANUFACTURE OF PERCHLOROETHYLENE AND TRICHLOROETHYLENE BY CATALYTIC OXYCHLORINATION, AND IMPROVED CATALYSTS THEREFOR

Robert P. Hirschmann; William Q. Beard, Jr., both of Wichita; Eric L. Mainz, Colwich; Earl B. Smith, Newton, all of Kans., and Barry M. Little, Castlewood, S. Dak., assignors to Vulcan Chemicals, Wichita, Kans.

Filed Dec. 15, 1989, Ser. No. 451,303

Int. Cl.^{5} C07C *17/15, 19/156*

U.S. Cl. 570—224 **5 Claims**

1. In a process for the production of trichloroethylene and perchloroethylene by catalytic oxychlorination of a C_2 hydrocarbon or a partially chlorinated derivative thereof in a reaction zone comprising a fluidized bed of microspheroidal particles of catalyst maintained at a temperature between 370° and 470° C. and a pressure between 1 and 20 atmospheres and providing a superficial reaction zone residence time of 2 to 60 seconds, the improvement which comprises using as the catalyst a catalyst composition comprising a mixture of copper chloride, potassium chloride and magnesium chloride deposited in a catalytically active amount on a microspheroidal support comprising from 90 to 99.8 percent alumina and from 0.2 to 10 percent silica and having an initial surface area X in excess of 20 and less than 100 m^2/g, (a) the ratio of copper chloride, to potassium chloride in said salt mixture being between 0.5:1 and 5.0:1, the copper chloride being calculated as copper (II) chloride and (b) the ratio of $MgCl_2$ to KCl in said salt mixture being between 0.5:1 and 2.0:1, said salt mixture being deposited on said microspheroidal support at a catalyst loading Y which is dependent on the initial surface area X of said microspheroidal support, wherein Y is calculated from the equation

$$Y \text{ (expressed in weight percent)} = (0.102X + 12.57) \pm 20\%,$$

X being a figure corresponding to the initial surface area of the support expressed in square meters per gram.

5,004,850

BLENDED GASOLINES

Ewert J. A. Wilson, Albany, Ky., assignor to Interstate Chemical, Inc., Jupiter, Fla.

Filed Dec. 8, 1989, Ser. No. 447,543

Int. Cl.^{5} C07C *7/20*; C10L *1/16*

U.S. Cl. 585—1 **24 Claims**

1. A process for producing gasoline, comprising the steps of:

(a) blending liquid components comprising a low-weight

hydrocarbon component, a natural gasoline component, and a toluene component; and,

(b) withdrawing a vapor stream of light-weight hydrocarbons from said liquid components, whereby the vapor pressure of the resulting blended liquid product will be decreased.

5,004,851

PROCESS TO PRODUCE AROMATICS OF LOW ACID-WASH COLOR

George R. Durham, Baton Rouge, and Randy S. Hebert, Donaldsonville, both of La., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 98,837, Sep. 21, 1987, abandoned. This application Nov. 22, 1988, Ser. No. 275,665

Int. Cl.[5] C07C 7/163

U.S. Cl. 585—260 20 Claims

1. A process to produce benzene or toluene with an acid wash color of two or less from a stream containing primarily benzene or toluene with impurities which include olefins, said process comprising sequentially the steps of:

(1) fractionally distilling said stream such that the purity of the benzene or toluene is increased to at least about 99 percent by weight; and

(2) passing said stream after said distillation step in a liquid phase over a hydrogenation catalyst with a sufficient amount of hydrogen and under conditions such that substantially all olefins remaining in the stream are hydrogenated to paraffins but little benzene or toluene is hydrogenated.

5,004,852

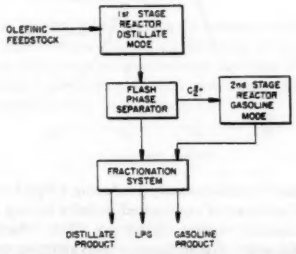
TWO-STAGE PROCESS FOR CONVERSION OF OLEFINS TO HIGH OCTANE GASOLINE

Mohsen N. Harandi, Lawrenceville, N.J., assignor to Mobil Oil Corp., Fairfax, Va.

Filed Aug. 24, 1989, Ser. No. 399,182

Int. Cl.[5] C07C 2/12, 15/02

U.S. Cl. 585—322 10 Claims



1. A continuous process for converting an olefinic feedstock containing ethylene and C_3+olefins by catalytic oligomerization and aromatization to produce high octane gasoline which comprises the steps of:

(a) contacting the olefinic feedstock in a first catalytic oligomerization zone with a crystalline zeolite oligomerization catalyst at pressure of about 240 to 2900 kPa (20 to 400 psig), temperature of about 170° to 510° C. and WHSV of about 0.1 to about 50 hr^{-1} to convert C_3+olefins to a first reaction zone effluent stream rich in oligomerized gasoline range hydrocarbons;

(b) flashing the first reaction zone effluent stream to separate said first reaction zone effluent stream into a liquid stream rich in C_5+ gasoline and a vapor stream rich in ethylene; and

(c) contacting the vapor stream from step (b) in a second catalytic reaction zone with a crystalline zeolite aromatization catalyst to pressure of about 150 to 1500 kPa (10 to 200 psig), temperature of about 510° to 820° C. (950° to 1500° F.) and WHSV of about 0.3 to 300 hr^{-1} to convert ethylene and other lower olefins to a second reactor effluent stream rich in aromatic gasoline.

5,004,853

CONTINUOUS PROCESS FOR THE PRODUCTION OF 2,6-DIMETHYLNAPHTHALENE

Paul T. Barger, Arlington Heights; Timothy J. Barder, Addison; David Y. Lin, Hinsdale, and Simon H. Hobbs, Chicago, all of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 174,561, Mar. 29, 1988, Pat. No. 4,835,334. This application Mar. 27, 1989, Ser. No. 328,654

The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.

Int. Cl.[5] C07C 5/22

U.S. Cl. 585—481 18 Claims

8. A continuous process for the production of 2,6-dimethylnaphthalenes including a two-stage adsorptive separation zone which comprises the steps of:

(a) passing a feed mixture of a feed stream comprising a mixture of dimethylnaphthalene isomers including 2,6, 2,7, and 1,7 isomers and the isomerization reaction zone product stream of step (e) below, into a fractionation means;

(b) separating the feed mixture in the fractionation means into hydrocarbon fraction having a boiling point higher than DMN isomers, a hydrocarbon fraction having a boiling point higher than DMN isomers, and into a first process stream fraction comprising dimethylnaphthalene isomers including 2,6, 1,7, and 2,7 isomers of dimethylnaphthalene;

(c) passing the first process stream into a two-stage adsorptive separation zone comprising a first stage employing a first stage adsorbent comprising a potassium-exchanged X-zeolite and a first stage desorbent material and operating at 2,6-dimethylnaphthalene rejective conditions to produce a first stage extract and raffinate product, with at least a portion of the raffinate product of the first stage being fed to a second stage, employing a second stage adsorbent comprising a carbon material and a second stage desorbent material and operating at 2,6-dimethylnaphthalene adsorptive conditions, thereby producing a second stage extract product containing purified 2,6-dimethylnaphthalene and a second stage raffinate stream;

(d) recovering the second stage extract stream containing purified 2,6-dimethylnaphthalene;

(e) feeding the first stage extract stream and the second stage raffinate stream into an isomerization reaction zone operating at isomerization reaction conditions including a temperature of from 300° to 450° C., a pressure of from 1 to 20 atmospheres, and a liquid hourly space velocity of from 0.5 to 5 hr^{-1} and into contact with an isomerization catalyst comprising from 10.0 to 60.0 wt. % of a crystalline aluminosilicate and from 0.1 to 5.0 wt. % of a platinum group metal component to produce an isomerization reaction zone product stream having a 2,6-dimethylnaphthalene concentration greater than that of the feed entering the isomerization reaction step; and

(f) passing the isomerization reaction zone product into the fractionation means of step (a).

5,004,854

PSEUDOCUMENE AND MESITYLENE PRODUCTION AND COPRODUCTION THEREOF WITH XYLENE

Tsoung Y. Yan, Philadelphia, Pa., assignor to Mobil Oil Corp., Fairfax, Va.

Filed Dec. 4, 1986, Ser. No. 937,845

Int. Cl.[5] C07C 4/12

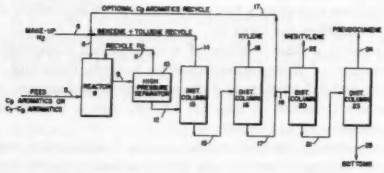
U.S. Cl. 585—489 15 Claims

1. A process for upgrading C_9 alkylaromatics, wherein mesitylene and pseudocumene are recovered from a mixture of C_9

aromatics including propylbenzene and methylethylbenzene, said process comprising the steps of:

(a) contacting a C_9 alkylaromatic feed stream with a shape-selective crystalline zeolite catalyst having a silica-to-alumina ratio of at least 12 and a constraint index from about 1 to 12 in the presence of hydrogen at a temperature of about 700° F. to 1100° F., a pressure of about 15 to 2000 p.s.i.g., a hydrogen to hydrocarbon mole ratio of 0.5 to 10.0 and a weight hourly space velocity of about 0.5 to 10.0, thereby selectively converting said propylbenzene and methylethylbenzene and forming a product mixture effluent comprising benzene, toluene, C_8 alkylbenzenes, C_9 alkylbenzenes and C_{10} alkylbenzenes;

(b) introducing the product mixture to a first distillation zone wherein benzene and toluene are distilled as an overhead



fraction and materials heavier than toluene are separated as a first bottoms fraction;

(c) introducing the first bottoms fraction to a second distillation column wherein xylene is distilled as an overhead fraction and materials heavier than xylene, comprising C_9 and C_{10} alkylbenzenes, are separated as a second bottoms fraction;

(d) introducing the second bottoms fraction to a third distillation column wherein mesitylene is distilled as an overhead fraction and C_9 and C_{10} alkylbenzenes are separated as a third bottoms fraction;

(e) introducing the third bottoms fraction to a fourth distillation column wherein pseudocumene is distilled as an overhead fraction and C_9 and C_{10} alkylbenzenes are separated as a fourth bottoms fraction.

5,004,855

PROCESS FOR CONVERSION OF ETHYLBENZENE IN C_8 AROMATIC HYDROCARBON MIXTURE

Kuniyuki Tada, Kamakura; Eiichi Minomiya, and Masatoshi Watanabe, both of Nagoya, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Aug. 19, 1988, Ser. No. 234,393

Claims priority, application Japan, Aug. 25, 1987, 62-212157; Aug. 25, 1987, 62-212158

Int. Cl.[5] C07C *4/12*

U.S. Cl. 585—489 **6 Claims**

1. A process for preparing p-xylene from a C_8 aromatic hydrocarbon mixture containing ethylbenzene and xylene, which comprises the steps of:

(a) converting ethylbenzene in said C_8 aromatic hydrocarbon mixture to benzene by contacting said C_8 aromatic hydrocarbon mixture in the presence of hydrogen with a catalyst comprising 0.6 to 20.0 parts by weight of rhenium, 100 parts by weight of a zeolite which consists essentially of an acid type zeolite having a main cavity inlet composed of a 10-membered oxygen ring and 100 to 900 parts by weight of alumina, said catalyst being substantially free of zeolites having main cavity inlets composed of 8-membered or 12-membered oxygen rings, and said catalyst having been subjected to a sulfiding treatment to effect hydrode-ethylation of ethylbenzene;

(b) separating C_8 aromatic hydrocarbon mixture from the resulting conversion reaction mixture; and

(c) feeding the separated C_8 aromatic hydrocarbon mixture to a circulation system comprising a p-xylene separating step and a xylene-isomerizing step to produce p-xylene.

5,004,856

PROCESS FOR UPGRADING METHANE TO HIGHER HYDROCARBONS

Lorenzo C. DeCaul, Chester, Pa.; Scott Han, Lawrenceville; Robert E. Palermo, Bloomfield, both of N.J., and Dennis E. Walsh, Richboro, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 29, 1989, Ser. No. 459,218

Int. Cl.[5] C07C *2/00*

U.S. Cl. 585—500 **8 Claims**

1. A process for synthesizing one or more hydrocarbons having at least two carbon atoms by the direct partial oxidation of methane, said process comprising contacting a mixture of methane and oxygen with a cadmium-manganese oxide catalyst under conditions sufficient to convert methane to said one or more hydrocarbons having at least two carbon atoms.

5,004,857

METHOD FOR CONTINUOUSLY PRODUCING LOW MOLECULAR WEIGHT POLYMER OF CONJUGATED DIOLEFIN

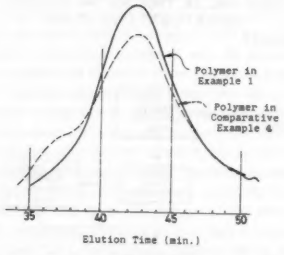
Shoji Iida; Kazuo Miyazaki, both of Yokohama, and Nobuyuki Takizawa, Yokosuka, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Japan

Filed Nov. 3, 1988, Ser. No. 267,508

Claims priority, application Japan, Jun. 11, 1987, 62-281597

Int. Cl.[5] C07C *2/02*

U.S. Cl. 585—507 **5 Claims**



1. A method for continuously producing a liquid low molecular weight polymer of conjugated diolefin having a number average molecular weight of 300 to 10000 which method comprises the step of continuously polymerizing or copolymerizing conjugated diolefin in an inert hydrocarbon solvent at a temperature within a range of 40° to 70° C. with maintaining the quantity of dissolved oxygen in the polymerization system at 1 ppm or below and in the presence of a polymerization catalyst of an organic sodium compound represented by the following general formula (I):

(I)

wherein Ar is an aryl group, R_1 and R_2 are the same or different and each of them is a hydrogen atom or an alkyl group having 1 to 20 carbon atoms and a chain transfer agent of an alkylaryl compound represented by the following general formula (II):

(II)

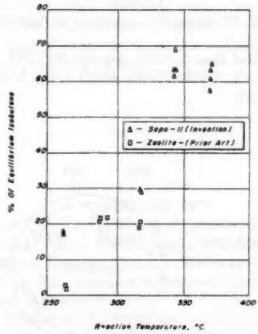
wherein Ar is an aryl group, R_3 and R_4 are the same or different and each of them is a hydrogen atom or an alkyl group having 1 to 20 carbon atoms.

5,004,858

BUTENE ISOMERIZATION PROCESS

Gregory J. Gajda, East White Plains, N.Y., assignor to UOP, Des Plaines, Ill.

Filed Nov. 29, 1989, Ser. No. 442,879
Int. Cl.[5] C07C 5/23
U.S. Cl. 585—667 **17 Claims**



1. A process for the isomerization of butenes which comprises contacting a butene-containing feedstock at isomerization conditions with a catalyst containing at least one NZMS to provide a product containing at least one butene isomer in greater concentration than in the feedstock.

5,004,859

CATALYST FOR THE ISOMERIZATION OF ALKANES

Robert J. Schmidt; Robert S. Haizmann, both of Rolling Meadows; Mark R. Ford, Buffalo Grove; C. David Low, Lisle, and Frank H. Adams, LaGrange Park, all of Ill., assignors to UOP, Des Plaines, Ill.

Filed Nov. 13, 1989, Ser. No. 435,304
Int. Cl.[5] C07C 5/22
U.S. Cl. 585—741 **4 Claims**

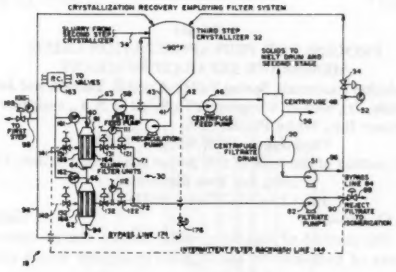
1. A process for isomerizing isomerizable hydrocarbons to form an isomerization product which process comprises contacting the isomerizable hydrocarbons with a bed of catalyst particles comprising a refractory inorganic-oxide support, from about 1 to 15 mass % of a Friedel-Crafts metal halide and from about 0.01 to 2 mass % on an elemental basis of a surface-layer platinum-group metal component, wherein the average concentration of platinum-group metal component on a 100-micron surface layer of the catalyst particles is at least 1.5 times the average magnitude of the concentration of platinum-group metal component in the central core of the catalyst particles.

5,004,860

FILTER SYSTEM

John S. Hansen, League City, and William A. Waranius, Texas City, both of Tex., assignors to Amoco Corporation, Chicago, Ill.

Filed Jul. 28, 1986, Ser. No. 890,127
Int. Cl.[5] C07C 7/14
U.S. Cl. 585—812 **32 Claims**



1. In a method for extracting high purity solid para-xylene crystals from a mother liquor feed slurry of mixed xylenes in liquid and crystal form in a separation unit of the type which includes a crystallization stage where the mother liquor slurry is cooled in at least one crystallizer to crystallize liquid para-xylene into solid crystals, an isomerization stage where xylenes, such as ortho-xylene and meta-xylene, are reacted over a catalyst bed to convert these xylenes into para-xylene, and a distillation stage where the mixed xylenes are separated form the impurities, the improvement comprising the steps of: withdrawing a portion of the liquid-crystal slurry from the crystallizer and passing the withdrawn portion of the liquid-crystal slurry to a filter system located outside of the aforesaid crystallizer, while at the same time withdrawing a portion of the liquid-crystal slurry from the crystallizer and supplying same to a centrifuge where solid crystal para-xylene is extracted from the liquid-crystal slurry; where, in such filter system, the aforesaid withdrawn portion of the liquid-crystal slurry is separated to form an essentially crystal-free liquid filtrate and a higher crystal concentrate liquid-crystal slurry where the essentially crystal-free liquid filtrate separated from the aforesaid withdrawn portion of the liquid-crystal slurry in the filter system is supplied to an isomerization stage thereby to increase the amount of solid para-xylene crystals extracted from the centrifuge over time and the higher crystal concentration liquid-crystal slurry separated from the aforesaid withdrawn portion of the liquid-crystal slurry in the filter system is either recycled to the crystallizer or passed to the centrifuge.

18. In an apparatus for extracting high purity solid para-xylene crystals from a mother liquor feed slurry of mixed xylenes in liquid and crystal form including a separation unit of the type which includes a crystallization stage where the mother liquor slurry is cooled in at least one crystallizer to crystallize liquid para-xylene into solid crystals, an isomerization stage where xylenes, such as ortho-xylene and meta-xylene, are reacted over a catalyst bed to convert these xylenes into para-xylene, and a distillation stage where the mixed xylenes are separated from the impurities, the improvement comprising a filter system located outside of the aforesaid crystallizer; means for withdrawing a portion of the liquid-crystal slurry from said crystallizer and passing the withdrawn portion of the liquid-crystal slurry to said filter system wherein the withdrawn portion of the liquid-crystal slurry is separated to form an essentially crystal-free liquid filtrate and a higher crystal concentration liquid-crystal slurry; a centrifuge; means for withdrawing a portion of the liquid-crystal slurry from said crystallizer and supplying same to said centrifuge where solid crystal para-xylene is extracted from the liquid-crystal slurry;

and means for supplying essentially crystal-free liquid filtrate separated from the aforesaid withdrawn portion of the liquid-crystal slurry in said filter system to said isomerization stage thereby to increase the amount of solid para-xylene crystals extracted from said centrifuge over time, and means for passing the higher crystal concentration liquid-crystal slurry separated from the aforesaid withdrawn portion of the liquid-crystal slurry in the filter system to either the crystallizer or the centrifuge.

5,004,861

PROCESS FOR PERVAPORIZATION USING MEMBRANE SEPARATING MEANS

Mordechai Pasternak, Spring Valley; Craig R. Bartels, and John Reale, Jr., both of Wappingers Falls, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 5, 1988, Ser. No. 214,987

The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.

Int. Cl.[5] C07C *7/144;* B01D *13/00*

U.S. Cl. 585—818 **9 Claims**

1. The method of separating water from a charge aqueous mixture of hydrocarbon and organic oxygenate which comprises

maintaining a non-porous membrane separating layer of (i) a blend of polyvinyl alcohol and a polyacrylic acid or consisting of (ii) cast polyvinyl alcohol which has been cross-linked with an aliphatic polyaldehyde containing at least three carbon atoms including those in said aldehyde groups;

maintaining a pressure drop across said non-porous separating layer;

passing a charge water-containing solution of hydrocarbon and organic oxygenate into contact with the high pressure side of said non-porous separating layer whereby at least a portion of said water in said charge aqueous mixture and a lesser portion of hydrocarbon and organic oxygenate pass by pervaporation through said non-porous separating layer as a lean mixture containing more water and less hydrocarbon and organic oxygenate than are present in said charge aqueous mixture and said charge aqueous mixture is converted to a rich liquid containing less water and more hydrocarbon and organic oxygenate than are present in said charge aqueous mixture;

recovering from the low pressure side of said non-porous separating layer said lean mixture containing more water and less hydrocarbon and organic oxygenate than are present in said charge aqueous mixture, said lean mixture being recovered in vapor phase at a pressure below the vapor pressure thereof; and

recovering from the high pressure side of said non-porous separating layer said rich liquid containing a lower water content and a higher hydrocarbon and organic oxygenate content than are present in said charge aqueous mixture.

5,004,862

PROCESS FOR RECYCLING AND PURIFYING CONDENSATE FROM A HYDROCARBON OR ALCOHOL SYNTHESIS PROCESS

Henry W. Hildinger, R.D. 1 Box D21 Cora La., Chester, N.J. 07930, and Edwin D. Carlson, 63 Castlewood Trail, Sparta, N.J. 07871

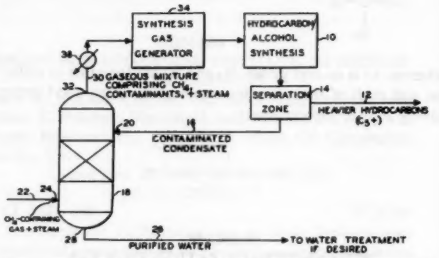
Filed Jun. 27, 1988, Ser. No. 211,745

Int. Cl.[5] C07C *7/00*

U.S. Cl. 585—867 **6 Claims**

1. A process for purifying a condensate stream from a hydrocarbon synthesis or alcohol synthesis process which comprises:

(a) contacting the condensate with a hot gaseous mixture comprising methane and steam to strip contaminants from the condensate, said contaminants comprising lower molecular weight hydrocarbons and oxygenates;



(b) recovering a gaseous stream comprising the contaminants and the gaseous mixture; and

(c) separately recovering purified water.

5,004,863

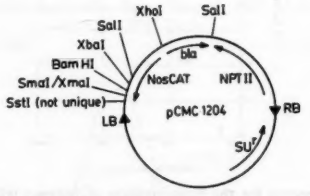
GENETIC ENGINEERING OF COTTON PLANTS AND LINES

Paul F. Umbeck, Madison, Wis., assignor to Agracetus, Middleton, Wis.

Filed Dec. 3, 1986, Ser. No. 937,384

Int. Cl.[5] C12N *15/00;* A01H *5/00, 5/10*

U.S. Cl. 800—205 **16 Claims**



1. A method of of introducing genes into cotton plants and plant lines comprising the steps of:

exposing hypocotyl tissue of immature cotton plants to a culture of transformation competent non-oncogenic *Agrobacterium tumefaciens* harboring a Ti plasmid having a T-DNA region including both a foreign chimeric gene and a selection agent resistance gene, both genes including appropriate regulatory sequences so as to be expressed in the cells of cotton plants;

culturing the exposed tissue in the presence of a selection agent for which the resistance gene encodes for resistance so as to select for plant cells transformed with the T-DNA region;

inducing somatic embryo formation in the exposed tissue in culture; and

regenerating the somatic embryos into whole cotton plants.

5,004,864

DOMINANT AMYLOSE-EXTENDER MUTANT OF MAIZE

Donald S. Robertson, and Philip S. Stinard, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Nov. 28, 1988, Ser. No. 276,882

Int. Cl.[5] A01H *5/00;* C12N *15/00*

U.S. Cl. 800—235 **11 Claims**

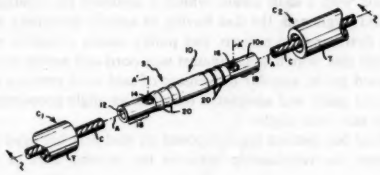
1. High amylose starch maize seeds containing at the *amylose-extender* (ae) locus at least one dominant mutant allele Ae-5180.

5,004,865

SPLICING DEVICE FOR FLUID-COOLED ELECTRIC CABLES

Theodore A. Krupnicki, 565 Adams Rd., Webster, N.Y. 14580

Filed Oct. 10, 1989, Ser. No. 418,499
Int. Cl.[5] H01B 7/34
U.S. Cl. 174—15.7 5 Claims



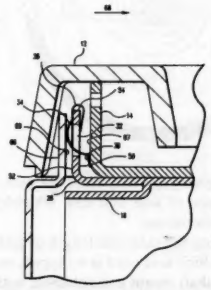
5. Apparatus for splicing together two lengths of fluid-cooled electric cable, said apparatus comprising an electrically conductive tubular member defined by an endless wall encircling an axis, said wall having a pair of apertures formed therein, said apertures being spaced inwardly from the respective ends of said member, the distal ends of said tubular member being adapted to be crimped closed by a crimping tool, said holes being located to be tilted relative to said axis after said ends have been crimped closed.

5,004,866

SELF-CONTAINED GROUNDING STRIP

Kevin K. Cooke, Delray Beach; John R. Dewitt, Boca Raton; Paul J. Galinis, Boynton Beach, and Walter B. Koteff, Boca Raton, all of Fla., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 27, 1989, Ser. No. 428,140
Int. Cl.[5] H05K 9/00
U.S. Cl. 174—35 GC 10 Claims



1. Apparatus for electromagnetically shielding electronic equipment comprising:

first and second spaced apart housing members and means defining a gap there between;

an interposer between said means defining said gap;

a spring member on said interposer and having portions thereof facing and extending towards said means defining said gap;

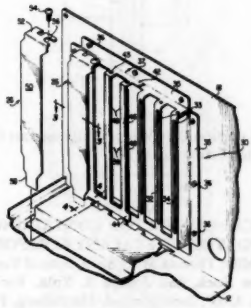
and a cover member for embracing said means defining said gap, and cam means associated with said cover member to effect closure of said gap to bias said first and second housing members against said spring member.

5,004,867

PERSONAL COMPUTER EXPANSION SLOT SEAL AND METHOD

Thomas R. Mast, Austin, Tex., assignor to Compuadd Corporation, Dallas, Tex.

Continuation of Ser. No. 270,266, Nov. 14, 1988, Pat. No. 4,873,395. This application May 25, 1989, Ser. No. 356,689
The portion of the term of this patent subsequent to Oct. 24, 2006, has been disclaimed.
Int. Cl.[5] H05K 9/00
U.S. Cl. 174—35 GC 7 Claims



1. An apparatus for retarding the escape of radio frequency from an electronic circuit chassis having four walls, said apparatus comprising:

at least one expansion slot for receiving additional electronic circuits, said expansion slot having edges defining a slot opening and adaptable to be affixed to one wall of said chassis;

a slot cover attached to said expansion slot and substantially overlying said slot opening;

sealing means disposed along the edges of said slot opening and between said expansion slot and said slot cover for sealing said slot opening and retarding the escape of radio frequency from said chassis; and

a spring-loaded retainer attachable to a chassis wall and engaging the base of said slot cover for forcing said slot cover against said sealing means and said expansion slot.

5,004,868

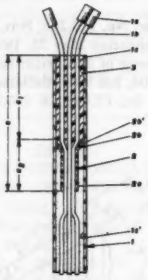
SEALING ARRANGEMENT FOR AN ELECTRICAL CABLE

Aydin Singor, Balve, Fed. Rep. of Germany, assignor to Leopold Kostal GmbH & Co. KG, Ludenscheid, Fed. Rep. of Germany

Filed Apr. 6, 1990, Ser. No. 505,891
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1989, 3911285
Int. Cl.[5] H02G 15/013
U.S. Cl. 174—76 3 Claims

1. In combination with an electrical cable, a sealing arrangement comprising: an insulating hose (1*c*) having one or more insulated electrical conductors (1*b*) within the electrical cable, the end portions of said conductors protruding from said insulating hose by a length determined by connections to be made; a pourable sealing compound (3) for sealing said insulating hose at at least one end thereof; and a presealing element (2) located in said insulating hose, said presealing element comprising an elastic sheath (2) which encloses all the individual conductors (1*b*) at a predetermined location (a2), said sheath having a tubular portion (2*a*) which presses said conductors

(1*b*) closely together and a funnel-shaped portion (2*b*) joined with said tubular portion (2*a*), the outer edge (2*b'*) of said



funnel-shaped portion (2*b*) fitting tightly against the inside wall of 1*c'*) of the insulating hose (1*c*).

5,004,869

ELECTRICAL CONNECTOR CONTAINING ADIPIC ACID POLYESTER SEALANT COMPOSITION

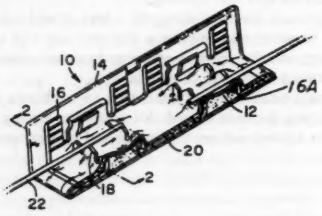
Francis F. Koblitz; Thomas M. O'Shea, both of York; Beverly A. Stoner, Glen Rock, and Joseph J. Yula, York, all of Pa., assignors to AMP, Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 767,566, Aug. 20, 1985, Pat. No. 4,714,801, which is a continuation of Ser. No. 620,411, Jun. 14, 1984, abandoned. This application Dec. 21, 1987, Ser. No. 136,143

The portion of the term of this patent subsequent to Dec. 22, 2004, has been disclaimed.

Int. Cl.[5] H01R *4/20*

U.S. Cl. 174—84 C **20 Claims**



1. A moisture-proof electrical connector for sealingly connecting transmission means therein comprising

(a) a connector body having a receiving means for accepting and receiving a transmission means; and

(b) a sealant composition disposed along or adjacent to the receiving means, said sealant composition comprising:

(i) polymeric adipic acid polyester in an amount at least about 50% by weight of the composition;

(ii) silica thickening agent dispersed in said polymer;

(iii) organofunctional coupling agent; and

(iv) polyfunctional bridging agent, said silica thickening agent and said coupling and said bridging agents being present in amounts sufficient to cause gelation of said composition.

5,004,870

POLAR CO-ORDINATE DIGITIZER

John J. Osborn, 2960 Paradise Dr., Tiburon, Calif. 94950

Filed Apr. 11, 1990, Ser. No. 508,248

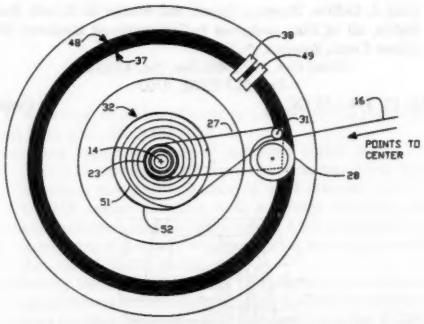
Int. Cl.[5] G08C *21/00*

U.S. Cl. 178—18 **7 Claims**

1. A polar co-ordinate digitizer for digitizing angle and length parameters of a planar form being traced by a stylus using a relatively fixed base support at the origin axis of the polar co-ordinate system of the digitizer, the system comprising a cord connected to the stylus extensible from the base support for providing said length parameter and a cord guide through which said cord extends and is pivoted substantially at said origin to provide said angle parameter, the improvement comprising:

angle detecting means including a first disk affixed for rotation with a shaft means which is mounted for rotation at said origin axis, the disk having an annular periphery with a first bar-type pattern, and pulley means rotatable with said disk which bears against said cord and serves as said cord guide, angular movement of said cord rotating said cord guide and associated first disk an angle proportional to said cord angle;

a fixed bar pattern superimposed on said first bar-type pattern, the relationship between the moving bars of said

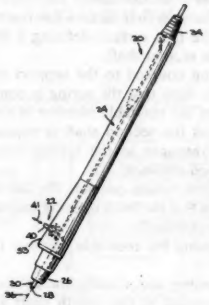


annular periphery and said fixed bar pattern being indicative of rotation of said first disk whereby said angle parameter is determined;

means for sensing the extended length of said cord, including a drum on which said cord is wrapped, mounted for rotation on said shaft means and rotatable with respect to said shaft means and including spring biasing means connected between said drum and said shaft means for restraining extension of said cord from said drum and tending to move said shaft in a rotary direction to bias said pulley means against said cord, said cord sensing means including a second disk fixed for rotation with said drum and having an annular periphery with a second bartype pattern; and

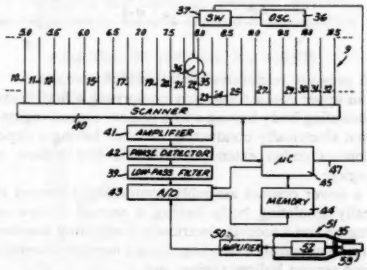
a relatively fixed bar pattern superimposed on said second bar-type pattern, the relationship between the moving bars of said annular periphery and said fixed bar pattern being indicative of rotation of said second disk whereby said length parameter is determined.

5,004,871
DIGITIZER STYLUS HAVING SIDE SWITCH
Alexander M. Purcell, Guilford, Conn., assignor to Summagraphics Corporation, Seymour, Conn.
Filed Nov. 13, 1989, Ser. No. 436,196
Int. Cl.[5] G08L *21/00*
U.S. Cl. 178—18 27 Claims



1. A stylus comprising an elongated housing and a device responsive to pressure or force applied thereto transversely of said housing to provide an output related to the magnitude of such applied pressure or force.

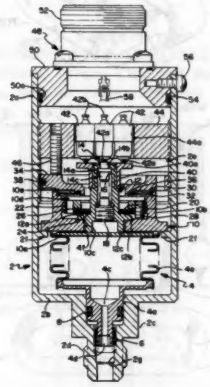
5,004,872
DIGITIZER TABLET WITH PRESSURE STYLUS
Daniel G. Lasley, Newtown, Conn., assignor to Summagraphics Corporation, Seymour, Conn.
Filed Nov. 14, 1989, Ser. No. 437,018
Int. Cl.[5] G08C *21/00*
U.S. Cl. 178—18 22 Claims



1. In a digitizer tablet comprising an electrode array, a pointing device whose position is to be located with respect to the array and whose applied pressure is to be determined with respect to the tablet, and means for energizing the array and tablet to generate position and pressure signals representative, respectively, of the pointing device position and pressure, said pointing device having a linear transducer for converting applied pointing device pressure into electrical signals linearly related to the applied pressure, the improvement comprising:

(a) means for processing the transducer electrical signals to convert their linear relation to pointing device pressure to a substantially logarithmic relation.

5,004,873
PLURAL SET POINT PRESSURE RESPONSIVE SWITCHING APPARATUS UTILIZING A SINGLE PRESSURE SENSING DRIVER ELEMENT
Robert H. Schnut, Carmel, N.Y., assignor to Eaton Corporation, Cleveland, Ohio
Filed Sep. 20, 1989, Ser. No. 410,174
Int. Cl.[5] H01H *35/32*
U.S. Cl. 200—83 P 24 Claims



1. A plural set point pressure switch comprising:

a pressure responsive driving element;

an actuator driven by said driving element;

a plurality of electric switches operated by said actuator;

a plurality of force responsive means blocking movement of said actuator and respectively sequentially unblocking said actuator for driven movement at respective predetermined pressure values;

a plurality of stop means respectively associated with said plurality of force responsive means, said stop means respectively sequentially arresting said driven movement of said actuator at respective increments of travel wherein said actuator operates a respective switch in each said increment of travel;

a plurality of separate adjustment means each individually respectively associated with said plurality of force responsive means and said plurality of stop means for adjustibly applying an individual initial force to each respective said force responsive means.

5,004,874
DIRECT CURRENT SWITCHING APPARATUS
Peter J. Theisen, West Bend; Daniel A. Wycklendt, Milwaukee; Mark A. Juds, New Berlin, and Peter K. Moldovan, Cascade, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio
Filed Nov. 13, 1989, Ser. No. 435,228
Int. Cl.[5] H01H *33/04, 33/18*
U.S. Cl. 200—144 R 27 Claims

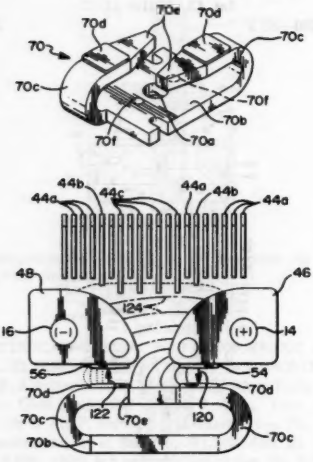
1. Direct current switching apparatus comprising:

a pair of arc extinguishing chambers each comprising a spaced pair of fixed conductors, respective conductors of one said chamber conductively connected to respective corresponding conductors of an other said chamber and to respective power terminals of said apparatus;

a first stationary contact conductively mounted on one of said conductors in said one chamber and a second stationary contact conductively mounted on an opposite one of said conductors in said other chamber; and

a movable contact extending within each said chamber movable into and out of bridging engagement with said first and second stationary contacts, said movable contact

establishing first and second arcs between said movable contact and said first and second stationary contacts, respectively, upon movement out of bridging engagement therewith, said first arc transferring from said movable



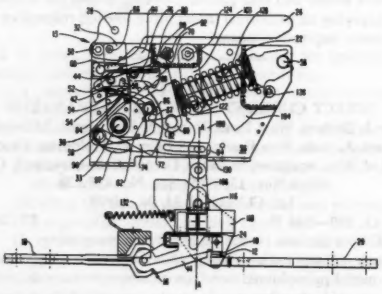
contact to an opposite said conductor in said one chamber establishing a current path comprising said first arc directly between said respective spaced pair of conductors, eliminating said second arc.

5,004,875

STORED ENERGY CONTACT OPERATING MECHANISM

G. Lawrence Moody; David A. Leone, both of Lawrenceville, and Mark E. Bell, Atlanta, all of Ga., assignors to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Oct. 11, 1988, Ser. No. 255,894
Int. Cl.[5] H01H *5/00*
U.S. Cl. 200—400 **12 Claims**



1. A circuit breaker that permits selective compression of a spring, comprising:

a support structure;

a first contact and a second contact for carrying current, the contacts being adapted to be opened and closed;

means for storing energy including:

a rotatable member being rotatable in a first direction about and supported by a first shaft supported by the support structure;

a second shaft supported by the rotatable member such that the second shaft is substantially parallel to the first shaft and offset from the first shaft;

a third shaft supported by the support structure such that the third shaft is substantially parallel to the first shaft and offset from the first shaft;

a fourth shaft supported by the rotatable member such that the fourth shaft is substantially parallel to the first shaft and offset from the first shaft;

a latch member rotatable about the third shaft, the latch member defining a first surface for resting upon the second shaft, the first surface defining a latch opening for engaging the second shaft;

the spring being coupled to the support structure and the second shaft, such that the spring is compressed to store energy when the rotatable member is rotated in the first direction, and the second shaft is engaged by the latch opening in response to the spring being compressed a predetermined distance;

a first stop latch which restricts the latch members from rotating such that the latch opening maintains engagement with the second shaft;

means for rotating the rotatable member in the first direction; and

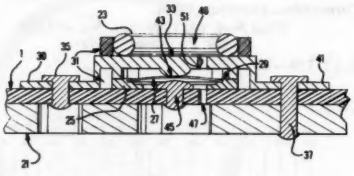
means for opening and closing the contacts, wherein the means is coupled to the fourth shaft such that energy stored in the compressed spring can be utilized to close the contacts.

5,004,876

PRESSURE RESPONSIVE SWITCH PARTICULARLY ADAPTABLE FOR OPERATION AS A NORMALLY OPEN OR A NORMALLY CLOSED SWITCH

Dale R. Sogge, Randolph, Mass.; Edward F. O'Brien, Providence, and David A. Czarn, Cumberland, both of R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 20, 1988, Ser. No. 286,726
Int. Cl.[5] H01H *35/34*
U.S. Cl. 200—83 P **14 Claims**



1. A pressure responsive switch, which comprises:

(a) an upper contact assembly comprising a first electrically insulating body having a first hollow central region and a first electrically conducting member having a depending contact ember extending into said first hollow central region;

(b) a lower contact assembly comprising a second electrically insulating body having a second hollow central region and a second electrically conducting member having an upwardly extending contact member extending into said second hollow region; and

(c) a pressure responsive snap acting member responsive to predetermined pressure thereagainst to switch from one of an upwardly extending and a downwardly extending condition to the other of said conditions and a third electrically conducting member, said snap acting member and said third member being sandwiched between said upper and lower contact assemblies, said third member including an aperture with at least one of said contact members received therein and electrically insulated from said other contact member, said snap acting member being positioned over said aperture in said third member and between said depending and upwardly extending contact members, at least one of said first and second electrically

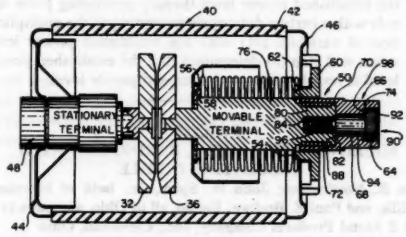
conducting members extending internally and externally of its respective insulating body.

5,004,877

VACUUM INTERRUPTER

Simon Yin, Fremont, Calif., assignor to Square D Company, Palatine, Ill.

Filed Oct. 3, 1988, Ser. No. 252,679
Int. Cl.[5] H01H *33/66*
U.S. Cl. 200—144 B 28 Claims



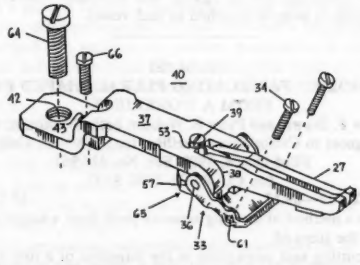
1. A vacuum interrupter, comprising:
a cylindrical envelope;
an endcap hermetically sealed at each circumferential edge of said cylindrical envelope;
a stationary terminal rigidly mounted in a central portion of one endcap; and
a movable terminal mounted for axial movement along its central longitudinal axis in a central position of an opposite endcap, said movable terminal comprising a rotatable external portion in electrical contact with a non-rotatable internal portion, said rotatable external portion being fixed relative to said non-rotatable internal portion along said central longitudinal axis when said external portion rotates relative to said internal portion.

5,004,878

MOLDED CASE CIRCUIT BREAKER MOVABLE CONTACT ARM ARRANGEMENT

Raymond K. Seymour, Plainville; Marshall B. Hart, Middletown; Gary D. Magnon, Bristol; Michael C. von Kannewurff, West Willington, and Dennis J. Doughty, Plainville, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Mar. 30, 1989, Ser. No. 330,521
Int. Cl.[5] H01H *33/02*
U.S. Cl. 200—144 R 10 Claims



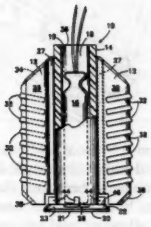
1. A current limiting circuit interrupter comprising:
a molded plastic case and cover;
a movable contact arm support within said case having load terminal screw receiving means formed at one end and movable contact arm attachment means formed at an opposite end thereof;
a movable contact arm supported within said movable contact arm attachment means and arranged for driving a movable contact out of electric connection with a fixed contact upon occurrence of an intense overcurrent condition through said contacts; and
a shunt clip attached to said movable contact arm support and abutting said movable contact arm to thereby maintain electric connection between said movable contact arm support and said movable contact arm when said movable contact is driven out of electric connection with said fixed contact.

5,004,879

SWITCH HOUSING WITH RESILIENT RETAINERS

Everett A. Bernhardt, Oregon City, and Robert C. Winters, Lake Oswego, both of Oreg., assignors to Sentrol, Inc., Portland, Oreg.

Filed Dec. 7, 1989, Ser. No. 447,536
Int. Cl.[5] H01H *9/02*
U.S. Cl. 200—295 21 Claims



1. A switch housing for insertion into a cavity comprising:
(a) hollow body means for holding a switch, said hollow body means having a cylindrical surface and being free from openings in said cylindrical surface;
(b) a wing of resilient material extending from said cylindrical surface of said hollow body means and formed integrally therewith, said wing being resiliently movable with respect thereto between a position in which said wing extends away from said hollow body means and a position in which said wing is located alongside said body means; and
(c) means for biasing said wing to exert pressure outwardly away from said body means against an interior surface of said cavity for retaining said housing in said cavity.

5,004,880

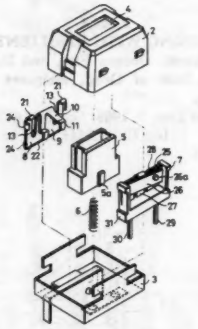
CLICK-TYPE PUSH BUTTON SWITCH WITH IMPROVED LEAF SPRING

Yoshirou Koutaka, Iwaki, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 348,616, May 5, 1989, abandoned. This application Jul. 20, 1990, Ser. No. 560,509
Claims priority, application Japan, Jul. 25, 1988, 63-97345[U]
Int. Cl.[5] H01H *13/02*
U.S. Cl. 200—521 1 Claim

1. In a push button switch including a casing unit composed of
a first casing and a second casing,
a switch device provided in said casing unit,
a stem slidably supported by said casing unit for switching on and off said switch device,
biasing means for normally elastically biasing said stem in such a direction as to restore an initial condition of said stem,
and a clicking leaf spring adapted to abut against said stem for giving a click feeling to an operator upon depression of said stem;
an improvement wherein said clicking leaf spring comprises:

a base portion having opposite ends abutting against opposed inner surfaces of said first casing and said second casing and thereby being held between said first casing and said second casing, said base portion further having at least two curved portions formed at opposite side edges adapted to elastically abut against the inner surface of said first casing such that said base portion may be fixedly positioned in said first casing with respect to a lateral direction.



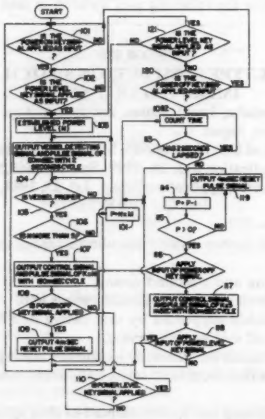
and a spring portion split from said base portion by a pair of slits having closed ends, the straight-line distance between said spring portion being bent such that said spring portion is removed from both said first casing and said second casing, thereby allowing said spring portion to bend at said spring fulcrum, thus increasing the effective length of said spring portion.

5,004,881

METHOD AND CIRCUIT FOR CONTROLLING POWER LEVEL IN THE ELECTROMAGNETIC INDUCTION COOKER

Min Ki Lee, Changwon, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 22, 1989, Ser. No. 440,264
Int. Cl.[5] H05B *6/06*
U.S. Cl. 219—10.77 **4 Claims**



1. A method of controlling a power level of an EI cooker by turning a power transistor off and on to alternate a direction of current flowing in a working coil, the power transistor being turned on and off according to pulse signals received from a central processing unit, comprising the steps of:

(a) establishing a power level for the EI cooker;

(b) determining if the established power level is greater than or equal to a predetermined power level;

(c) controlling a pulse width of the pulse signals from the central processing unit by multiplying a variable (K) with the established power level repeatedly when said step (b) determines that the established power level is greater than or equal to the predetermined power level; and

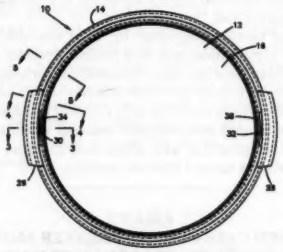
(d) controlling a duty cycle of the pulse signals from the central processing unit by multiplying variables (M) with the established power level thereby generating pulse signals with a certain duty cycle according to the multiplication of variables (M) with the established power level when said step (b) determines that the established power level is less than the predetermined power level.

5,004,882

MICROWAVABLE METAL BAKING PAN WITH INSULATING GIRDLE

John R. Nottingham; John W. Spirk, Jr., both of Moreland Hills, and Paul E. Brokaw, Euclid, all of Ohio, assignors to G & S Metal Products Company, Inc., Cleveland, Ohio

Filed Sep. 13, 1989, Ser. No. 406,687
Int. Cl.[5] H05B *6/80*
U.S. Cl. 219—10.55 E **8 Claims**



1. A cooking utensil for use inside microwave or conventional ovens having side walls, said utensil comprising:

a metal vessel having a lip encircling its mouth; and

a girdle of a both electrically and thermally insulating material, said girdle encircling and fastened to said lip, whereby spacing of said vessel from the sides of said oven is provided about the entire lip, wherein said girdle includes:

a shoulder receiving said lip; and

a rib retaining said lip against said shoulder, whereby said girdle is snap-fit attached to said vessel.

5,004,883

METHOD OF FABRICATING PLURAL SHAPED PARTS FROM A WORKPIECE

Andrew F. Brown, and Peter B. Webber, both of Whittier, Calif., assignors to Calcor Space Facility, Inc., Whittier, Calif.

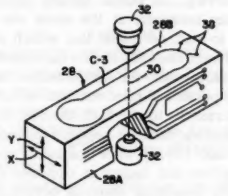
Filed Oct. 4, 1989, Ser. No. 416,961
Int. Cl.[5] B23H *7/06, 9/00*
U.S. Cl. 219—69.12 **15 Claims**

1. In a method of forming separate parts from a single workpiece, the steps of:

(1) cutting said workpiece in the direction of a first axis of the workpiece and along interrupted lines in a plane normal to said first workpiece axis conforming substantially to certain part outlines in such a way that the workpiece sections between the cuts remain integrally joined to the remainder of the workpiece, and

(2) thereafter cutting said workpiece in the direction of a second axis normal to said first workpiece axis and along

lines in a plane normal to said second workpiece axis conforming substantially to certain other part outlines in such a way that the cuts made in this cutting step (2) intersect all of the cuts made in cutting step (1) so as to



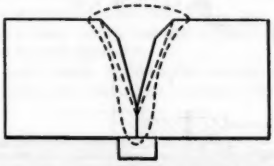
form separate shaped pieces separated from one another and from the remainder of the workpiece and having outlines when viewed in certain mutually perpendicular directions conforming substantially to said certain part outlines, respectively.

5,004,884

METHOD OF SUBMERGED ARC WELDING A THICK STEEL PLATE WITH LARGE HEAT INPUT AND SUBMERGED ARC WELDING FLUX

Shuichi Sakaguchi; Tadamasa Yamaguchi, and Itaru Yamashita, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Dec. 22, 1989, Ser. No. 454,920
Claims priority, application Japan, Dec. 28, 1988, 329458
Int. Cl.[5] B23K *9/18*
U.S. Cl. 219—73 **3 Claims**



1. A method of arc welding of thick steel plates with a large heat input and flux for submerged arc welding which comprises:

forming a groove having a multi-angle shape which has at least two different angular inclinations when a single side submerged arc welding for perfect penetration is conducted under a condition of an welding heat input of 100 to 1000 kJ/cm; using submerged arc welding flux composed by

SiO_2: 5 to 28% by weight,
MgO: 15 to 35% by weight,
CaO: 5 to 15% by weight,
CaF_2: 2 to 20% by weight,
Al_2O_3: 5 to 15% by weight, and
TiO_2: 2 to 10% by weight

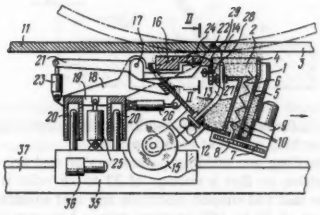
as the main components, and containing iron powder by 30 % by weight or less and either or both of Si and Mn in the metallic form by 10 % by weight, said submerged arc welding flux having a particles size distribution arranged such that the proportion of the particles which have a size finer than 36 mesh is 20 % by weight or less and the proportion of the particles which have a size 14 mesh or finer but 36 mesh or rougher is 60 % by weight or more; and conducting said welding.

5,004,885

APPARATUS FOR OVERHEAD SUBMERGED-ARC WELDING

Konstantin A. Juschenko, ulitsa Komandarma, Kameneva, 4a, kv. 115; Pavel A. Varenchuk, ulitsa Prazhskaya, 3, kv. 426; Valentin D. Kovalev, ulitsa Malo-Kitaevskaya, 58, kv. 2; Anatoly I. Chvertko, ulitsa Mechnikova, 18, kv. 86; Nikolai T. Privalov, ulitsa Prazhskaya, 3, kv. 118, and Vladimir G. Kuzmenko, ulitsa Lomonosova, 29, kv. 94, all of Kiev, U.S.S.R.

PCT No. PCT/SU88/00259, § 371 Date Feb. 6, 1990, § 102(e) Date Feb. 6, 1990, PCT Pub. No. WO89/11942, PCT Pub. Date Dec. 14, 1989
PCT Filed Dec. 14, 1988, Ser. No. 460,928
Claims priority, application U.S.S.R., Jun. 6, 1988, 4429060
Int. Cl.[5] B23K *9/18*
U.S. Cl. 219—73.2 **2 Claims**



1. An apparatus for overhead submerged-arc welding, comprising: a suspended pivotally mounted rotatable hopper containing flux and accommodating a bowl having means for supplying flux and pressing it against a work being welded, an open top part of the bowl facing towards the work being welded, a welding nozzle for supplying a consumable electrode extending through the bowl and mounted adjacent to a rear wall of the bowl relative to the welding direction, and a forming means mounted above a brim of the open top part of the bowl on a suspension supported by a first pivot pin, the forming means being mounted on said suspension for cooperation with the rear wall of the bowl relative to the welding direction, and for movement in longitudinal and transverse planes, the rear wall of the bowl relative to the welding direction being in the form of a movable plate mounted on a second pivot pin extending perpendicularly to a surface of the rear wall of the bowl relative to the welding direction, and mounted on a means for pressing an upper end face of the movable plate against a front end extremity of the underside of the forming means, the hopper containing flux being supported by the first pivot pin supporting the suspension of the forming means.

5,004,886

METHOD OF APPLYING WEAR-RESISTANT LAYER AND CONSUMABLE ELECTRODE FOR CARRYING OUT THE METHOD

Dieter Born, Ratingen; Peter Knauf, Mettmann, and Hans-Joachim Retelsdorf, Zirndorf, all of Fed. Rep. of Germany, assignors to Durum Verschleissschutz GmbH, Krefeld, Fed. Rep. of Germany

Filed May 18, 1990, Ser. No. 526,230
Claims priority, application Fed. Rep. of Germany, May 20, 1989, 3916559; Mar. 14, 1990, 4008091
Int. Cl.[5] B23K *9/04*
U.S. Cl. 219—76.14 **10 Claims**

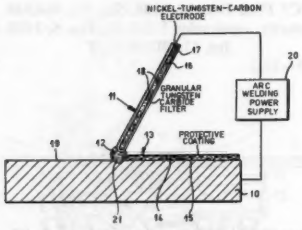
1. A process for applying a wear-resistant layer to an electrically conductive surface, comprising the steps of:

(a) juxtaposing with said surface a consumable rod-shaped electrode comprised of a nickel tube and, within said tube, a filling consisting of:

50 to 40 percent by weight nickel,
45 to 55 percent by weight tungsten,

0.1 to 1.5 percent by weight boron,
3 to 4 percent by weight carbon, and
0 to 2 percent by weight silicon,
the sum of carbon, boron and silicon being substantially 5 percent by weight, and including a fluxing agent and tungsten carbide particles in said filling of a grain size of 0.3 to 2.0 mm in said tube, the compositions of said nickel tube and said filling making up 100% of said layer;

(b) depositing said layer on said substrate by arc welding deposition from said rod-shaped electrode so that said



layer is formed as a nickel-alloy matrix containing tungsten carbide grains as inclusions; and

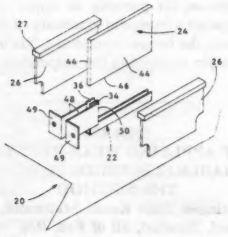
(c) controlling arc welding parameters of said arc welding deposition so that a voltage of 22 to 26 volts is applied across said rod-shaped electrode and said substrate and a current of 70 to 150 amperes passes between said rod-shaped electrode and said substrate, and such that there is practically no solubilization of said tungsten carbide grains in said nickel-allow matrix during the arc welding deposition.

5,004,887

HEATING APPARATUS HAVING CURIE EFFECT HEATER

Michael J. McKee, New Cumberland; William D. Miknis; Joseph M. Pawlikowski, both of Lancaster, and William E. Zelko, Dauphin, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 24, 1989, Ser. No. 384,331
Int. Cl.[5] B23K *1/00*
U.S. Cl. 219—85.16 **19 Claims**



15. A soldering apparatus for soldering an array of first coplanar conductors, such as the conductors in a flat cable, to an array of second conductors, such as spaced-apart terminal pads on a substrate, the apparatus comprising a work holder for holding the first and second conductors adjacent to each other and in registry, a heater bar assembly which is mounted on a fixture means and is normally spaced from the work holder, the fixture means having a heater bar assembly moving means for moving the heater bar assembly to the work holder thereby to bring the heater bar assembly into engagement with the conductors on the work holder, the apparatus being characterized in that:

the heater bar assembly comprises an insulating support member and a bi-metallic self-regulating Curie effect heater, the support member having a supporting edge and two major surfaces extending from the supporting edge,

the heater having a non-magnetic layer having a relatively high conductivity and a magnetic layer having a relatively low conductivity, the heater having opposite ends and having heater terminals at the ends, the heater being folded, end to end, on a fold line which is substantially mid-way between the ends so that the heater terminals are adjacent to each other, the folded heater comprising two substantially parallel aligned sections which extend from the heater terminals to the fold, the two sections having their non-magnetic surfaces opposed to, and proximate to, each other and having their magnetic surfaces remote from each other and facing in opposite directions, the heater having insulating material between the opposed non-magnetic surfaces,

the heater being secured to the support member with the supporting edge against the magnetic material of one of the folded sections, with the supporting edge extending from the terminals to the fold, and with the magnetic material of the other folded section facing away from the support member whereby,

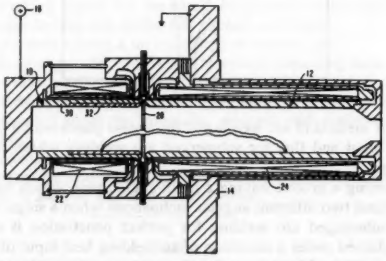
upon placement of the first and second conductors in the work holder, moving the heater bar assembly towards the work holder and positioning the supporting edge adjacent to the conductors so that the magnetic material of the other folded section is against the conductors, and passing a high frequency current through the heater, the first and second conductors will be soldered to each other.

5,004,888

PLASMA TORCH WITH EXTENDED LIFE ELECTRODES

Charles B. Wolf, Irwin; Shyam V. Dighe, North Huntingdon; Paul E. Martin, West Mifflin; Raymond F. Taylor, Jr., Penn Township, and William J. Melilli, Belle Vernon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 21, 1989, Ser. No. 454,495
Int. Cl.[5] B23K *9/00*
U.S. Cl. 219—121.520 **20 Claims**



1. A plasma torch comprising:

first and second tubular electrodes arranged substantially colinearly along an axis with adjacent ends defining a gap therebetween;

means for initiating an arc across said gap;

means for supplying a gas to be heated through said gap into space within said tubular electrodes and causing the arc to extend to respective arcing portions of said electrodes' inner surfaces that are less than the entire extent of said inner surfaces;

means for rotating the arc so it moves circumferentially about said electrodes' surfaces and heats gas therebetween;

one of said electrodes being open to allow heated gas to exit the torch;

at least one of said first and second electrodes comprising a

shell consisting principally of a first conductive metal and said arcing portion consisting principally of a conductive metal that is more durable than said first conductive metal under the arcing conditions of the heated gas located on an inner surface of said shell.

5,004,889
LASER POWER CONTROLLING METHOD

Etsuo Yamazaki, Hachioji; Nobuaki Iehisa, and Kazuhiro Suzuki, both of Minamitsuru, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

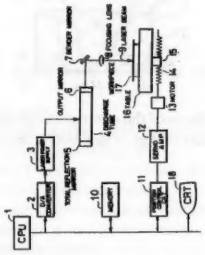
PCT No. PCT/JP88/00891, § 371 Date Apr. 17, 1989, § 102(e) Date Apr. 17, 1989, PCT Pub. No. WO89/02335, PCT Pub. Date Mar. 23, 1989

PCT Filed Sep. 3, 1988, Ser. No. 343,260

Claims priority, application Japan, Sep. 10, 1987, 62-226791

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.61 **2 Claims**



1. A laser power controlling method in which a laser output is controlled by an NC instruction as a function of an instruction regarding the moving speed of a mechanical system, the method comprising the steps of:

providing an instruction regarding moving speed to a simulator approximated to said mechanical system with a first-order or second-order function; and

generating a laser output instruction based on the result obtained by said simulator,

whereby synchronism between the moving speed of the mechanical system and the laser output control is assured.

5,004,890
METHOD OF EVALUATING QUALITY OF A LASER BEAM IN A LASER PROCESSING MACHINE

Gnian C. Lim, Auburn Hills, Mich., assignor to Amada Company, Limited, Japan

Filed Feb. 20, 1990, Ser. No. 481,514

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.83 **7 Claims**

1. A method of evaluating quality of a laser beam in a laser processing machine which comprises a frame, and the laser processing head supported on the frame free to move in the X-, Y-, and Z-axis directions and free to rotate about a vertical axis and a horizontal axis, the method comprising the steps of:

(a) mounting a dynamical laser beam analyzer on the frame of the laser processing machine;

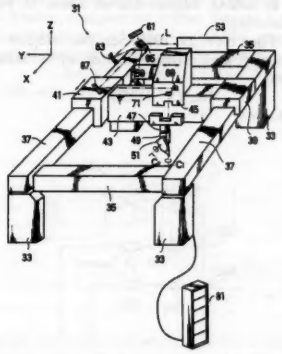
(b) moving the laser processing head in the X-, Y-, and/or Z-axis directions so that the head is positioned in front of the dynamical laser beam analyzer;

(c) rotating the laser processing head about the vertical axis and/or the horizontal axis so that a tip section is directed to a beam entrance section of the dynamical laser beam analyzer;

(d) detecting an instantaneous profile of a laser beam by means of the dynamical laser beam analyzer;

(e) repeating the detection of the step (d);

(f) calculating values of a beam stability parameter of the laser beam profiles, each value of the beam stability parameter corresponding to one of the laser beam profiles;



(g) calculating a standard deviation of the beam stability parameters from the values of the beam stability parameter calculated in the step (f).

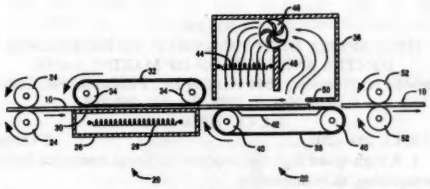
5,004,891
TWO-STAGE METHOD AND APPARATUS FOR GLOSSING A DEVELOPER SHEET

Robert A. Landis, Kettering, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Apr. 14, 1989, Ser. No. 338,901

Int. Cl.[5] G03G *15/20*

U.S. Cl. 219—388 **6 Claims**



1. A method of glossing an image sheet having a resin layer on one side thereof which glosses at a predetermined temperature T, comprising the steps of:

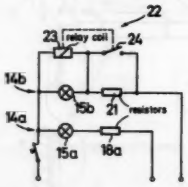
placing said sheet with the resin side thereof in contact with a conductive heating means;

applying heat to the resin side of the sheet to bring the sheet to a temperature just below said temperature T;

removing the resin side of said sheet from contact with said conductive heating means; and

applying heat to the resin side of said sheet from a non-contact heating source to raise the temperature of said sheet to a temperature at or above said temperature T.

5,004,892
RADIANT ELEMENT
Gerhard Goessler, Oberderdingen; Eugen Wilde, Knittlingen, and Rolf Seeburger, Sulzfeld, all of Fed. Rep. of Germany, assignors to E.G.O. Elektro-Gerate Blanc U. Fischer, Fed. Rep. of Germany
Filed Nov. 29, 1989, Ser. No. 443,559
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1988, 3840360
Int. Cl.[5] H05B 3/74
U.S. Cl. 219—464 7 Claims



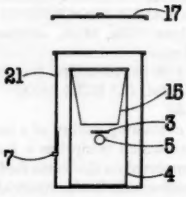
1. A radiant element, particularly for glass ceramic hotplates, comprising:
means for coupling the radiant element to a source of electrical energy;
the radiant element defining a heating area;
at least two electric visible light radiator heating means connected in parallel and arranged in different heating zones of said heating area;
selection switching means for selectively switching one or both of said heating means in said different heating zones to said source;
temporarily operable damping means for damping energization of the heating means for a limited time following each switching in of the heating means, said damping means having a resistor located in said heating area; and,
means for connecting said resistor in series with both said heating means in said different zones for said limited time and disconnecting said resistor when said limited time has elapsed, whereupon both heating means are connected without an interconnected series resistor to said source of energy.

5,004,893
HIGH-SPEED, HIGH TEMPERATURE RESISTANCE HEATER AND METHOD OF MAKING SAME
Brooke N. Westover, 1044 Fleming Dr., Pensacola, Fla. 32514
Filed Nov. 7, 1988, Ser. No. 268,188
Int. Cl.[5] H05B 3/10
U.S. Cl. 219—505 8 Claims

1. A high-speed high temperature electrical resistance heater comprising, in combination:
(a) a composite, non-homogeneous body having an essentially electrically-conducting material and an essentially electrically insulating material,
(b) one of said materials being constituted as a porous matrix,
(c) the other of said materials permeating said matrix of said one material,
(d) said electrically-conducting material having nodes and connective threads interconnecting said nodes, and
(e) means for effecting electrical connections to different places on said electrically-conducting material,
(f) said matrix comprising a body having a generally cylindrical outer surface,
(g) said body having a through bore of stepped configuration, the dimension of the inner portion of the bore being

greater than those of the outer portions thereof, to thereby form an annular bridge in said body, intermediate its ends.

5,004,894
CLOTH WARMER
Jimmy Whitehead, 5500 Brookhaven, Mobile, Ala. 36693
Filed Oct. 3, 1988, Ser. No. 252,783
Int. Cl.[5] H05B 3/10
U.S. Cl. 219—521 15 Claims



1. A cloth warmer warming moistened cloth towels in a container having a lip and lid comprising:
(a) at least 2 inner walls and a floor defining an inner chamber defining a ridge along an upper most edge of the inner walls for receiving the lip wherein at least one of said inner walls defines a notch;
(b) an outer chamber made of insulating material:
(c) a warming means within a lower portion of the inner chamber and fixedly attached to the inner chamber;
(d) a heat deflector means disposed above the warming means and below the ridges, said heat deflector means being attached to the inner chamber above a point of attachment of the warming means.

5,004,895

HEATER DEVICE USED FOR FLOOR MATERIAL ETC. AND FLOOR MATERIAL WITH HEATER CONTAINED THEREIN

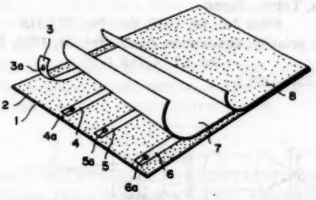
Yoshinori Nishino, Yamatotakada, and Junjiro Kishigami, Osaka, both of Japan, assignors to Nippon Basic Technology Laboratory Co., Ltd., Japan

Filed Jul. 7, 1989, Ser. No. 376,818

Claims priority, application Japan, Jul. 8, 1988, 63-90665[U]; Jul. 8, 1988, 63-90669[U]; Nov. 14, 1988, 63-148172[U]

Int. Cl.[5] H05B *3/36*

U.S. Cl. 219—528 7 Claims



1. A heater device used for a floor material and the like comprising,

an insulating sheet,

a plurality of belt-shaped electrodes arranged side by side at intervals on said insulating sheet,

a plastic radiant body layer formed on the insulating sheet and said belt-shaped electrodes,

an insulating layer formed on said radiant body layer, and

means for supplying an electric current between a selected pair of said electrodes.

5,004,896

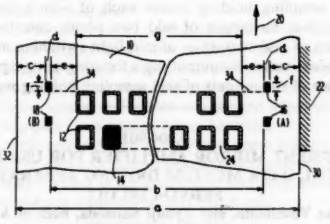
OPTICAL DOCUMENT SCANNING AND MARK SENSING

Robert Serrell, Princeton; J. Lamar Smith, Hopewell, both of N.J., and Frederick L. Kurst, Centreville, Md., assignors to Educational Testing Service, Princeton, N.J.

Filed Jul. 26, 1989, Ser. No. 385,382

Int. Cl.[5] G06K *5/00, 7/10*

U.S. Cl. 235—437 10 Claims



1. Method of optically scanning a document having rows of material to be scanned comprising, in combination, the steps of:

(a) transporting the document beneath a camera, the document having generally parallel sides, the camera scanning the document along a direction substantially parallel to one of the sides;

(b) automatically providing a measure of document size in at least a direction parallel to the direction of scanning at each row of material to be scanned but before scanning each row of material; and,

(c) automatically adjusting the scanning of each row of material to be scanned to compensate for random variations in shrinkage and expansion of document size.

5,004,897

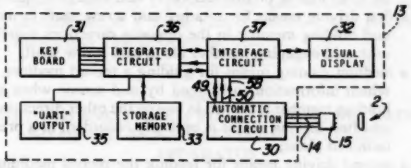
AUTOMATIC CONNECTING DEVICE DESIGNED FOR THE QUICK AND MOMENTARY SUPPLY OF POWER TO ELECTRONIC CIRCUITS

Alain Biggio, Limonest, and Jacques Landrevie, La Chambre, both of France, assignors to Aliflex Europe S.A., France

Continuation-in-part of Ser. No. 765,261, Aug. 13, 1985, abandoned. This application Aug. 15, 1988, Ser. No. 232,629

Int. Cl.[5] G06K *7/15, 19/77*

U.S. Cl. 235—441 8 Claims



1. A quick automatic connection device comprising:

an electronic chip having a contact surface, said contact surface having a plurality of conducting areas from one another and arranged about a central axis;

a sensor having a like plurality of electrically conductive tips, each engageable with one of said plurality of conducting areas when said sensor is pressed against said contact surface;

alignment means for rotating said sensor with respect to said contact surface to assure each of said electrically conductive tips engage with a respective one of said conducting areas when said sensor is pressed against said contact surface independent of the rotational orientation between said sensor and said electronic chip; and

electronic circuit means associated with said sensor for sensing the total rotational orientation of said sensor with respect to said electronic chip to identify the particular conducting area to which each of said plurality of electrically conductive tips is engaged.

5,004,898

OPTICAL READING DEVICE

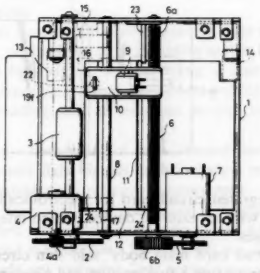
Hiroshi Ihsikawa; Kazuo Hasegawa, both of Furukawa, and Masaki Gotoh, Sendai, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 9, 1989, Ser. No. 392,232

Claims priority, application Japan, Nov. 25, 1988, 63-296286; Nov. 25, 1988, 63-296287; Nov. 25, 1988, 63-296288; Nov. 25, 1988, 63-296289; Dec. 15, 1988, 63-315027; Dec. 15, 1988, 63-315028; Feb. 2, 1989, 1-22666; Feb. 6, 1989, 1-25907; Feb. 6, 1989, 1-25908; Feb. 6, 1989, 1-25909

Int. Cl.[5] G06K *13/00*

U.S. Cl. 235—475 25 Claims



1. An optical reading device, comprising:

a holding member having a sensor of the reflecting type carried thereon;

a supporting means provided on said holding member in a spaced relationship by a predetermined distance from a location of said sensor;

an engaging member supported for pivotal motion by said supporting means;

at least one of said engaging member and said holding member having a toothed portion formed thereon;

a screw shaft having a spiral groove formed on an outer periphery thereof such that said spiral groove may be meshed by said toothed portion in a direction perpendicular to an axis of pivotal motion of said engaging member;

a first driving means for rotating said screw shaft to move said holding member in the opposite directions together with said engaging member along said screw shaft;

a medium guiding means for guiding a record medium, on which information to be read by said sensor when said holding member is moved in one or the other direction by said first driving means is optically recorded, in a predetermined plane;

a second driving means for feeding the record medium in said predetermined plane in a direction perpendicular to the direction in which said holding member is moved by said first driving means;

a guide shaft disposed in parallel to said screw shaft for guiding said sensor when said holding member is moved in one or the other direction;

a contact element provided on said holding member for assuring a minimum distance between said sensor and a surface of the record medium to be read by said sensor; and

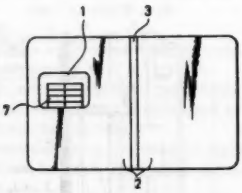
a resilient member disposed between said holding member and said engaging member for urging said holding member and said engaging member with respect to a location at which a guide portion formed either on said holding member or on said engaging member is slidably contacted with said guide shaft such that said contact element of said holding member may be resiliently contacted with a sliding face provided by the record medium or said medium guiding means and said toothed portion on said holding member or said engaging member may be resiliently engaged with said spiral groove of said screw shaft.

5,004,899

SEMICONDUCTOR CARD WHICH CAN BE FOLDED

Tetsuya Ueda, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 26,967, Mar. 17, 1987, Pat. No. 4,849,617.
This application Apr. 14, 1989, Ser. No. 337,875
Claims priority, application Japan, Mar. 17, 1986, 61-60250
The portion of the term of this patent subsequent to Jul. 18, 2006, has been disclaimed.
Int. Cl.[5] G06K *19/06*
U.S. Cl. 235—492 **5 Claims**



1. An integrated circuit card for electronically exchanging information with an external device, which integrated circuit card comprises:

a thin circuit card main body, said thin circuit card main body comprising a first portion and a second portion;

a semiconductor module mounted in said first portion of said circuit card main body, said semiconductor module containing data to be read by the external device; and

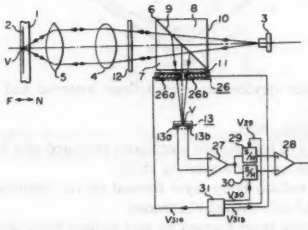
folding means permitting said first portion be folded substantially shut with respect to said second portion to thereby facilitate storage of said integrated circuit card for the user.

5,004,900

FOCUSING ERROR DETECTING APPARATUS WITH LIGHT SWITCHING AND DETECTOR SAMPLING

Masatomo Seya; Michihiro Tadokoro, and Kazuo Okada, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 10, 1989, Ser. No. 377,315
Claims priority, application Japan, Jul. 21, 1988, 63-182109
Int. Cl.[5] G01J *1/20*
U.S. Cl. 250—201.5 **5 Claims**



1. A focusing error detecting apparatus which comprises:

a ray source for emitting a ray flux,

a focusing means for focusing the ray flux to a focal point on a surface of an object substrate,

a light detecting means comprising two photo detectors,

an optical means for focusing a ray flux reflected from said surface of object substrate so that the ray flux comes to the middle of a space formed between said two photo detectors when the focal point is formed on said surface of object substrate,

a light switching means for switching the ray flux transmitted from said optical means said light switching means having two switching states which respectively pass the ray flux to said two photo detects of the light detecting means,

two sampling holding means each of which respectively receives an output of said two photo detectors during each of said two states of said light switching means, and

a process means for outputting a focusing error signal on the basis of the outputs of said sampling holding means.

5,004,901

CURRENT MIRROR AMPLIFIER FOR USE IN AN OPTICAL DATA MEDIUM DRIVING APPARATUS AND SERVO-CIRCUIT

Kyosuke Yoshimoto, and Kyouji Shimoda, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

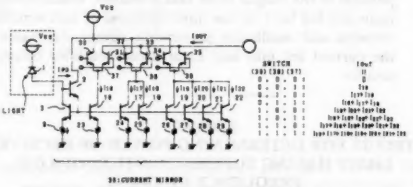
Filed Jun. 28, 1988, Ser. No. 212,566
Claims priority, application Japan, Jun. 30, 1987, 62-160841; Jun. 4, 1987, 62-139044
Int. Cl.[5] G01J *1/20*; H03K *3/01*
U.S. Cl. 250—201.5 **13 Claims**

1. An optical data medium driving apparatus and a servo circuit, comprising:

a photosensor which outputs a current signal corresponding to a quantity of transmitted light or reflected light from an optical data medium;

an amplification means intercoupled to and receiving said photosensor output current signal including a current

mirror circuit having a plurality of switching elements, each switching element providing a current signal equal to said photosensor output current signal; and



means for combining selected ones of said current signals thereby amplifying said output current signal from said photosensor by said current mirror circuit.

5,004,902

FOCUSED POINT DETECTING OPTICAL SYSTEM

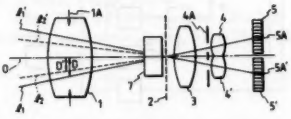
Hiroshi Matsui, Hino, and Akitoshi Toda, Kunitachi, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1989, Ser. No. 300,598

Claims priority, application Japan, Jan. 22, 1988, 63-11982

Int. Cl.[5] G01J *1/20*; H01J *3/14*; G02F *1/13*; G03B *3/00*

U.S. Cl. 250—201.8 **14 Claims**



1. A focussed point detecting optical system for detecting a focussed condition of an image of an object formed by an imaging optical system having an exit pupil such that the exit pupil can take various positions on an optical axis, comprising:

at least a pair of reimaging lenses arranged apart from an imaging plane of said imaging optical system on the side opposite to said imaging optical system;

a stop having apertures individually corresponding to said pair of reimaging lenses, arranged adjacent to said pair of reimaging lenses; and

a variable refractive index optical element which is symmetrical with respect to a plane including the optical axis of said imaging optical system, said plane being perpendicular to a straight line connecting the centers of said pair of reimaging lenses, and which is arranged adjacent to said imaging plane and retains a lens function,

said variable refractive index optical element being varied in refractive index so that an image of said exit pupil is substantially formed at the position of said stop, irrespective of the various positions of said exit pupil.

5,004,903

CONTACT TYPE IMAGE SENSOR DEVICE WITH SPECIFIC CAPACITANCE RATIO

Koichi Kitamura; Hidenori Mimura; Kazuo Yamamoto Yasumitsu Ohta and Kazuyoshi Sai all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

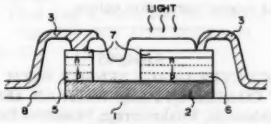
Filed Apr. 2, 1990, Ser. No. 503,179

Claims priority, application Japan, Mar. 31, 1989, 1-81258

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—208.1 **11 Claims**

1. A contact type image sensor device comprising a plurality of photodiodes connected in a matrix for converting a light signal to an electrical signal depending on light intensity and comprising an equal numbers of blocking diodes to prevent a cross talk phenomenon, wherein



a capacity ratio of a photoelectric part constituting said photodiodes to a diode part constituting said blocking diodes is in a range of 2:1 to 30:1.

5,004,904

METHOD AND SYSTEM FOR CONTROLLING GAIN AND OFFSET IN RADIATION MEASUREMENT APPARATUS

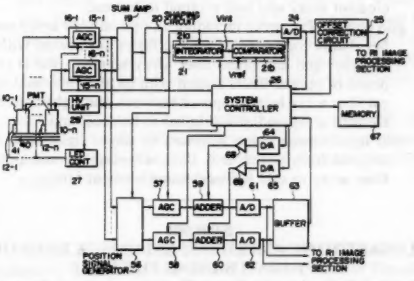
Tsutomu Yamakawa, Tochigi, and Hiroaki Kobayashi, Ootawara, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 13, 1989, Ser. No. 365,385

Claims priority, application Japan, Jun. 17, 1988, 63-150913; Jun. 17, 1988, 63-150914; Aug. 19, 1988, 63-206081; Aug. 19, 1988, 63-206082; Aug. 31, 1988, 63-218920

Int. Cl.[5] H01J *40/14*; G01T *1/20*

U.S. Cl. 250—207 **8 Claims**



6. A method of controlling gain and offset in a radiation measurement apparatus during radiation measurement, the method comprising the steps of:

generating at least one first standard light signal during a first period and generating at least one second standard light signal during a second period, the amplitude of said first standard light signal being different from the amplitude of said second standard light signal;

converting light from said generating means and light indicative of said radiation measurement into measurement light signals;

detecting at least one first measurement light signal during said first period from light including said at least one first standard light signal, and detecting at least one second measurement light signal during said second period from light including said at least one second standard light signal;

determining whether or not said detected first and second measurement light signals each include a radiation light signal representing radiation measurement;

obtaining from said first and second measurement light signals first and second correction values when said first and second measurement light signals are determined to not include any radiation light signal representing radiation measurement, said first and second correction values

each corresponding respectively to said first and second standard light signals; and

controlling the gain in accordance with said first correction value and controlling the offset in accordance with said first and second correction values.

5,004,905

CONTACT TYPE IMAGE SENSOR WITH A FIBER ARRAY COATED IN PART WITH AN ABSORBER

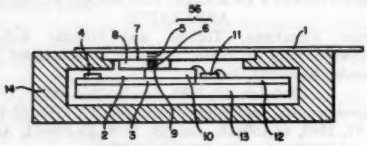
Atsushi Yoshinouchi, Kitakatsuragi; Masataka Itoh, Nara, and Shuhei Tsuchimoto, Kitakatsuragi, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Nov. 8, 1989, Ser. No. 432,995

Claims priority, application Japan, Nov. 10, 1988, 63-286533; Feb. 28, 1989, 1-49650; Apr. 6, 1989, 1-89173

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—208.1 **9 Claims**



1. A contact type image sensor comprising:

a light-detecting element array formed on a substrate,

a light source for irradiating an original to be read, and

an optical fiber array disposed between said light-detecting element array and said original to be read,

said optical fiber array including an optical fiber array member that is composed of optical fibers not coated with an absorber and an optical fiber array member that is composed of optical fibers coated with an absorber, said optical fiber array being disposed between said light-detecting element array and said original to be read, and

said light source being disposed to direct light onto said original from which it is then reflected via said optical fiber array to said light-detecting element array.

5,004,906

LOGARITHMIC AMPLIFIER, AND IMAGE READ-OUT APPARATUS USING THE SAME

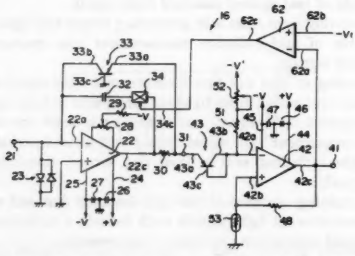
Yoshimi Takasaki, and Kazuo Horikawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 18, 1990, Ser. No. 466,837

Claims priority, application Japan, Jan. 20, 1989, 1-11386

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—214 A **19 Claims**



1. A logarithmic amplifier comprising an amplifier, which is provided with a feedback circuit and a logarithmic conversion device in said feedback circuit of said amplifier,

wherein the improvement comprises the provision of:

(i) an oscillation preventing circuit which is provided with a capacitor connected in parallel with said logarithmic conversion device, and

(ii) a control circuit which controls said oscillation preventing circuit in accordance with the current fed into said logarithmic amplifier, so that the amount of certain components in the output from said amplifier, which components are fed back to the input terminal of said amplifier through said oscillation preventing circuit, decreases as the current fed into said logarithmic amplifier becomes smaller.

5,004,907

CIRCUIT FOR DETERMINING POWER OF RECEIVED LIGHT HAVING SUPERIMPOSITION OF LOW FREQUENCY CURRENT

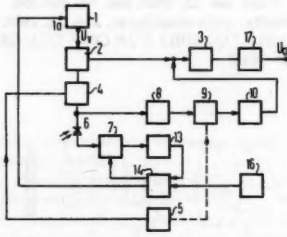
Karl-Heinz Prasse, Mittenwald, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 15, 1989, Ser. No. 407,741

Claims priority, application European Pat. Off., Sep. 15, 1989, 88115133.6

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—214 AG **20 Claims**



1. A circuit for determining light power received by a photodiode of an optical receiver, wherein bias voltage of said photodiode is controlled by a control means depending on the received light power, comprising:

(a) modulation means for superimposing a low-frequency current having a constant amplitude on a photoelectric current of said photodiode;

(b) rectifier means operatively connected to the photodiode for rectifying a low-frequency voltage resulting from the superimposition of said low-frequency current; and

(c) an output terminal connected to an output of the rectifier means.

5,004,908

REFLECTION TYPE PHOTOELECTRIC SWITCH FOR DETECTING THE PRESENCE OF AN OBJECT

Arata Nakamura, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Dec. 28, 1987, Ser. No. 138,052

Claims priority, application Japan, Dec. 26, 1986, 61-312456

Int. Cl.[5] G01V *9/04*

U.S. Cl. 250—221 **12 Claims**

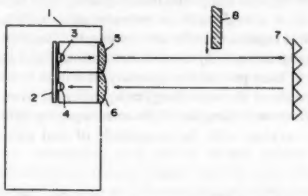
1. A reflection type photoelectric switch which detects the presence of an object, comprising:

light emitting means for emitting a substantially single light beam having first and second different wavelengths into a space in which the object may be detected, wherein said light emitting means comprises a single light emitting diode which emits light at said first and second wavelengths.

a reflector for reflecting said substantially single light beam at different rates with respect to said first and second wavelengths,

light receiving means for sensing said first and second wavelengths of the reflected light beam and which generates

outputs in response to said first and second wavelengths, and



means for analyzing said outputs generated by said light receiving means to generate an output representing the existance in the space of the object detected by the photoelectric switch.

5,004,909

METHOD AND APPARATUS FOR INSPECTING SIDEWALLS OF BOTTLES USING STRIPE PATTERN ILLUMINATION

Hiroyuki Fukuchi, Yokohama, Japan, assignor to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Filed May 26, 1989, Ser. No. 357,265
Claims priority, application Japan, May 30, 1988, 63-130154
Int. Cl.[5] G01N *9/04*
U.S. Cl. 250—223 B **40 Claims**

1. A method of inspecting the sidewalls of bottles comprising the steps of:

illuminating the sidewall of a bottle by light in a pattern of alternating shadowed and illuminated stripes to transmit an image of alternating dark and light stripes therethrough;

photoelectrically converting the image transmitted through the sidewall of the bottle;

scanning the photoelectrically converted transmitted light image along a scan line in a direction transverse to the dark and light stripes;

sensing the brightness at at least three points near one another along said scan line, said at least three points comprising a central point and outer points on both sides of said central point;

comparing the brightness of said at least three points with each other;

detecting a defect point at said central one of said at least three points when the brightness of the central point differs from the brightness of each of the outer points on both sides of the central point by more than a set value; and

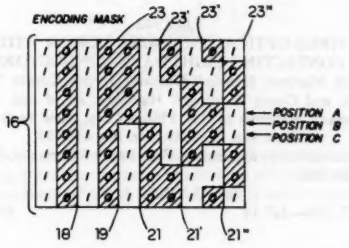
judging the presence of a defect on the sidewall of the bottle based on the defect point.

5,004,910

METHOD OF DECODING ENCODED RELATIVE SPECTRAL DATA

Eric M. Arnett, South Bend, Ind., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Aug. 4, 1989, Ser. No. 389,481
Int. Cl.[5] G01J *3/50*; G01D *5/34*
U.S. Cl. 250—226 **4 Claims**



1. A method of decoding a relative spectrum data for a plurality of positions that have been encoded by a wave length multiplexer sensor, said method comprising the steps of:

generating a spectrum of light having at least a predetermined band-width, said spectrum being made up of segments of a plurality of individual bits;

modulating the individual bits of said spectrum to produce a modulated spectrum having data bits derived from on/off and off/on transitions relating to a plurality of adjacent data bits, said modulated spectrum having a start data bit with a constant width which precedes each segment of the spectrum of light represented by said data bits, said start data bit being identified by an always on field followed by an always off field; and

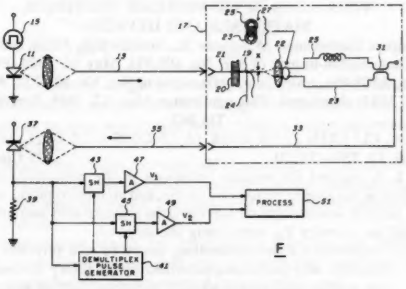
locating the center of each data bit through a transition edge to determine the difference between adjacent data bits and thereby determining the location of the next transition edge in the plurality of data bits.

5,004,911

TIME MULTIPLEXED FIBER OPTIC SENSOR

Rudolph C. Dankwort, and Charles D. Klem, both of Phoenix, Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 20, 1989, Ser. No. 368,626
Int. Cl.[5] H01J *5/16*
U.S. Cl. 250—227.21 **4 Claims**



1. A fiber optic sensor comprising:

means for receiving optical signals from a first light propagation path;

means coupled to said receiving means for deflecting said receiving means for a reference position in accordance

with a measured parameter, thereby providing a deflected optical signal;

delay means responsive to said deflected optical signal for providing first and second optical signals with a time delay interval therebetween, said first and second optical signals having relative intensities that are functions of said measured parameter; and

means for coupling said first and second optical signals to propagate along a second light propagation path.

5,004,912

FIBER-OPTICAL PRESSURE SENSOR WITH CONTACTING LIGHTWAVE CONDUCTORS

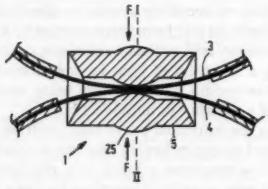
Gerhard Martens, Henstedt-Ulzburg; Jürgen Kordts, Norderstedt, and Georg Weidinger, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Sep. 21, 1989, Ser. No. 410,695

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1988, 3832569

Int. Cl.[5] H01J *5/16*

U.S. Cl. 250—227.14 **10 Claims**



1. A fiber-optical sensor, comprising a light transmitter device (6) which couples transmitted light into at least one first lightwave conductor, and also comprising a light receiver device (7) which receives light from the first lightwave conductor and at least one second lightwaveconductor, the lightwave conductors (3, 4) comprising adjacently situated portions between which light can be coupled, and wherein the light transmitter device (6) couples a first transmitted light into the first lightwave conductor (3, 4) and a second transmitted light into the second lightwave conductor (4, 3), the adjacently situated portions (1) of the lightwave conductors (3, 4) being accommodated together in an envelope (5) via which a pressure or force acts on the lightwave conductors (3, 4), portions of the lightwave conductors (3, 4) contacting one another in a light-transferring manner under the influence of said pressure or force.

5,004,913

REMOTE MEASUREMENT OF PHYSICAL VARIABLES WITH FIBER OPTIC SYSTEMS - METHODS, MATERIALS AND DEVICES

Marcos Kleinerman, 24 Jerome St., Southbridge, Mass. 01550

Continuation-in-part of Ser. No. 608,932, May 14, 1984, Pat. No. 4,708,494, which is a continuation of Ser. No. 405,732, Aug. 6, 1982, abandoned. This application Mar. 12, 1985, Ser. No. 711,062

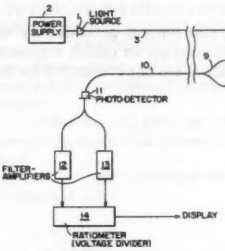
Int. Cl.[5] G01N *21/64*; G01K *11/12*; G02B *5/14*; G01L *7/02*

U.S. Cl. 250—227.21 **28 Claims**

1. A method for sensing variations in the magnitude of a physical parameter by use of a probe, and an interrogating light of suitable wavelength or wavelengths injected into said probe with an intensity P_o, comprising the steps of:

(a) exposing a light-transmitting probe to said physical parameter, said probe characterized by an ability to attenuate within said probe an interrogating light of suitable wavelength and an intensity P_o entering the probe to an intensity $P_o(1-\alpha)$, where α is a parameter-dependent fraction smaller than unity, and to substantially convert the fraction αP_o of the intensity of the interrogating light into a light separable from the interrogating light, at least part of the intensity of which is emitted from the probe at wavelengths λ_1 different from the wavelength of the interrogating light.

(b) injecting into the probe interrogating light of intensity P_o and of a wavelength or wavelengths within a suitable spectral region, thereby converting the fraction αP_o of the intensity of said injected interrogating light into emitted light at least part of the intensity of which is emitted from the probe at the wavelengths λ_1 different from the wavelength or wavelengths of the interrogating light, the value of α varying with the magnitude of said parameter, and



said emitted light having an intensity varying with the value of α;

(c) directing a fraction of the intensity of said emitted light to photodetector means;

(d) sensing the variations of the intensity of said emitted light received by said photodetector means, said variations being an indicator of the variations of the magnitude of the physical parameter; and

(e) thereby sensing the variations in the magnitude of the physical parameter from the variations of the intensity of said emitted light received by said photodetector means.

5,004,914

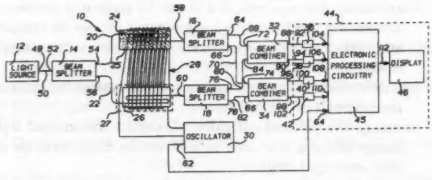
FIBER-OPTIC INTERFEROMETRIC CHEMICAL SENSOR

Victor Vali, Laguna Hills; David B. Chang, Tustin, and Patrick C. Brownrigg, Long Beach, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 20, 1990, Ser. No. 511,666

Int. Cl.[5] H01J *5/16*

U.S. Cl. 250—227.27 **15 Claims**



1. An apparatus for detecting presence of a given chemical vapor, said apparatus comprising:

a light source;

a first substrate exposed to the chemical vapor;

collector means on the first substrate for collecting the chemical vapor onto the substrate;

a first optical fiber on the first substrate and coupled to the light source;

a second substrate isolated from the chemical vapor;

a second optical fiber on the second substrate and coupled to the light source;

magnetic field generator means for subjecting both first and second substrates to an oscillating magnetic field;

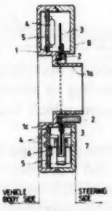
said first and second substrates being constructed so that the dimensions thereof change in response to the oscillating magnetic field thereby altering characteristics of light from the light source passing through the first and second optical fibers, characteristics of the light in the first optical fiber being different from the characteristics of the light in the second optical fiber when the first substrate is exposed to said given chemical vapor whereby said first optical fiber provides an optical sensor signal and said second optical fiber generates an optical reference output signal; and

means for comparing said optical sensor signal with said optical reference output signal and for providing an output signal, based on said comparing, which is indicative of the presence of said given chemical vapor.

5,004,915
STEERING ANGLE SENSOR APPARATUS

Keiichi Umehara; Hisashi Hirose, and Kazuo Kono, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Aug. 9, 1989, Ser. No. 391,022
Claims priority, application Japan, Aug. 12, 1988, 105976[U]
Int. Cl.[5] G01D *5/34*
U.S. Cl. 250—231.14 **10 Claims**



1. A steering angle sensor apparatus for mounting on a vehicle steering apparatus which includes a steering shaft that rotates during a steering operation and a stationary member, said steering angle sensor apparatus comprising:

disc means, for attachment to one of the steering shaft and the stationary member, including indications for indicating steering rotational angle;

a circuit substrate, for attachment to the other one of the steering shaft and the stationary member, including circuit elements forming a steering angle sensor circuit;

sensor means, operatively coupled to said sensor circuit, for reading said indications, at least one element of said sensor means being attached to said circuit substrate;

cover means for enclosing said disc means, said circuit substrate and said sensor means; and

said circuit substrate being positioned within said cover means to confront a surface of said disc means.

5,004,916
SCANNING SYSTEM HAVING AUTOMATIC LASER SHUTDOWN UPON DETECTION OF DEFECTIVE SCANNING ELEMENT MOTION

Donald A. Collins, Jr., Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

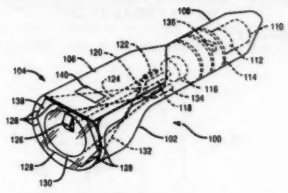
Filed Jul. 28, 1989, Ser. No. 387,551
Int. Cl.[5] H01J *3/14*
U.S. Cl. 250—235 **18 Claims**

1. A method of laser shutdown in a laser scanning system capable of reading the likes of a bar code comprising the steps of:

moving a scanning element by a motor coupled to said scanning element;

producing a laser beam for focus upon and deflection by said scanning element, said laser beam thus being able to scan the likes of a bar code;

driving said motor, and outputting signals from sensors coupled to said motor corresponding to scanning element movement; and

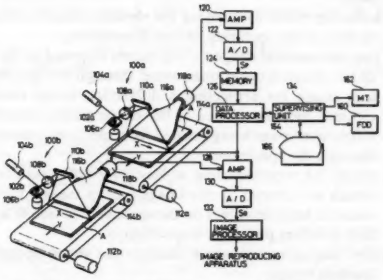


receiving signals from said sensors and automatically shutting down the operation of said laser when the amount of movement of said scanning element is below a threshold.

5,004,917
RADIATION IMAGE INFORMATION READING APPARATUS

Kunimasa Shimizu; Masao Shigyo, and Hiroshi Tanaka, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 12, 1990, Ser. No. 508,678
Claims priority, application Japan, Apr. 17, 1989, 1-96762
Int. Cl.[5] H01J *3/14*
U.S. Cl. 250—236 **4 Claims**



1. A radiation image information reading apparatus for photoelectrically reading radiation image information from a recording medium which stores the radiation image information, comprising:

processing means for establishing reading conditions and/or image processing conditions based on the radiation image information which has been read from the recording medium;

determining means for determining whether said reading conditions and/or said image processing conditions fall outside of a predetermined range or not; and

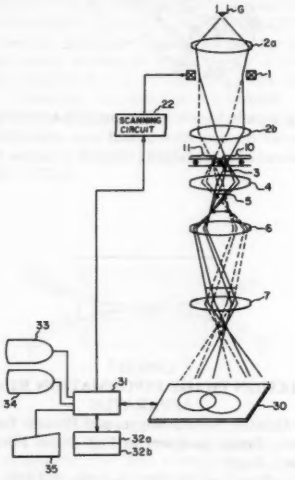
storage means for holding the radiation image information and data used to establish the reading conditions and/or the image processing conditions if the reading conditions and/or the image processing conditions fall outside of said predetermined range.

5,004,918

DIFFERENTIAL PHASE CONTRAST SCANNING TRANSMISSION ELECTRON MICROSCOPE

Katsushige Tsuno, and Masao Inoue, both of Tokyo, Japan, assignors to Jeol Ltd., Tokyo, Japan

Filed Jan. 24, 1990, Ser. No. 468,750
Claims priority, application Japan, Jan. 25, 1989, 1-15590
Int. Cl.[5] H01J *37/28*
U.S. Cl. 250—311 4 Claims



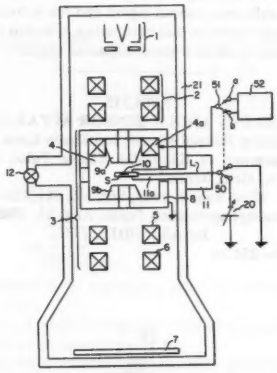
1. A differential phase contrast scanning transmission electron microscope, comprising:
an electron beam source for producing an electron beam;
a condenser lens for focusing the electron beam onto a specimen;
a scanning means for causing the electron beam to scan the surface of the specimen in two dimensions;
a two-dimensional image pickup means disposed in the path of the electron beam transmitted through the specimen;
a lens means for projecting a diffraction image onto the electron incident surface of the image pickup means, the diffraction image being created from electrons transmitted through the specimen;
a means for superimposing at least two diffraction images which are created by the image pickup means when the electron beam impinges on the specimen surface in at least two different positions, respectively;
a first display means which displays the superimposed diffraction image;
an arithmetic means which divides the region covered by the image pickup means into plural parts by at least one arbitrarily moveable boundary line and produces a signal indicating the difference between the relative number of electrons impinging on the plural parts, respectively;
an arbitrarily moveable pointing means for pointing positions on a viewing screen of said first display means which correspond to points of intersection between said diffraction images;
means for establishing the position of said arbitrarily moveable boundary line according to the signal which indicates the positions pointed by said pointing means; and
a second display means which displays an image of the specimen according to the differential signal from the arithmetic means and a signal related to the scanning means.

5,004,919

TRANSMISSION ELECTRON MICROSCOPE

Yukihito Kondo, Tokyo, Japan, assignor to Jeol, Ltd., Tokyo, Japan

Filed Jul. 2, 1990, Ser. No. 547,477
Claims priority, application Japan, Jul. 5, 1989, 1-173836; Aug. 11, 1989, 1-208185; Aug. 11, 1989, 1-208186; Oct. 4, 1989, 1-259495
Int. Cl.[5] H01J *37/26*
U.S. Cl. 250—311 12 Claims



1. A transmission electron microscope comprising:
an electron gun producing an electron beam;
a condenser lens system which focuses the electron beam onto a specimen;
an imaging lens system consisting of an objective lens, an intermediate lens, and a projector lens;
a display means upon which an image created by the electrons emitted from the specimen is displayed;
a voltage-applying means for applying a negative voltage to the specimen placed between the magnetic pole pieces of the objective lens; and
means for irradiating the specimen with exciting rays to induce photoelectrons from the lower surface of the specimen, whereby the photoelectrons emitted from the specimen are imaged by the imaging lens system.

5,004,920

METHOD OF PREPARING MEMBRANE FILTERS FOR TRANSMISSION ELECTRON MICROSCOPY

Richard J. Lee, Murrysville; Barbara A. Smith, Apollo; Robert G. Theys, Monroeville; Robert A. Theys, Pittsburgh, all of Pa., and Judy A. Murphy, St. Louis, Mo., assignors to RJ Lee Group, Inc., Monroeville, Pa.

Continuation of Ser. No. 359,150, May 31, 1989, abandoned.
This application Jun. 12, 1990, Ser. No. 537,156
Int. Cl.[5] G01N *1/28*
U.S. Cl. 250—304 14 Claims

1. The method for preparing specimens for viewing particles and/or fibers captured upon membrane filters with a TEM comprising the following steps:
(a) mounting a section of the membrane filter on a glass slide with a quick drying liquid applied between the filter membrane and the slide which liquid will not release the filter membrane when the slide is immersed in a selected solvent and such that the liquid will not render the filter membrane resistant to the selected solvent, the face of the membrane filter that has collected the particles and/or fibers to be observed facing away from the glass slide,
(b) drying the assembly,
(c) vacuum coating the filter section surface with carbon to

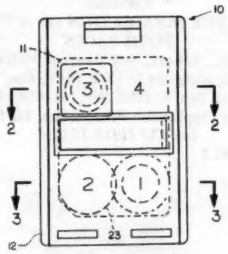
replicate the surface of the membrane filter and the particles and fibers thereupon,
(d) scoring the carbon coated membrane filter section into small sections,
(e) immersing the assembly in the selected solvent which will attack the filter material causing the carbon film squares to float off of the membrane filter, and
(f) capturing the film squares for use as transmission electron microscope specimens.

5,004,921

MIXED FIELD PERSONNEL DOSIMETRY METHOD AND APPARATUS FOR DETERMINATION OF RISK RELATED QUANTITY VIA A NEARLY TISSUE EQUIVALENT MULTI-ELEMENT THERMOLUMINESCENT DOSIMETER

Marko Moscovitch, Beachwood, Ohio, assignor to Solon Technologies, Inc., Solon, Ohio

Continuation-in-part of Ser. No. 216,343, Jul. 7, 1988. This application Nov. 6, 1989, Ser. No. 432,590
Int. Cl.[5] G01T *1/02, 1/11*
U.S. Cl. 250—337 **6 Claims**



1. A dosimetry method comprising
using a dosimeter to monitor exposure to a mixed radiation field composed of photons and neutrons, the dosimeter including first and second elements sensitive to photons and insensitive to neutrons and a third element sensitive to photons and neutrons, and first and second filters for said first and second elements having different photon attenuation characteristics and a third filter for said third element having a photon attenuation characteristic different from the photon attenuation characteristic of the first filter;
heating the radiated dosimeter to obtain thermoluminescence emission of the elements; and quantitatively relating the emission to the radiation incident on the dosimeter, said quantitatively relating including
determining a neutron component of incident radiation by taking the difference between the response of the first and third elements with one of the responses being weighted as a function of photon energy.

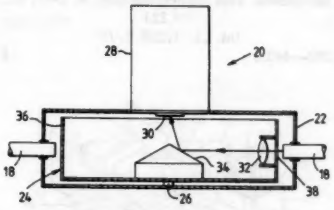
5,004,922

OPTICAL FIBER SCANNING SYSTEM FOR HEAT SENSING

Stanley A. Edwards, Wallasey, United Kingdom, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Oct. 16, 1989, Ser. No. 421,940
Int. Cl.[5] G08B *17/12*
U.S. Cl. 250—340 **8 Claims**

1. A scanning system for the detection of heat sources within an area to be maintained under surveillance, comprising two or more scanning units, optical scanning means for each scanning unit for cyclically scanning at least part of said area, a radiation sensor responsive to radiation indicative of a heat source and located remotely from the scanning units, optical fibre transmission elements each associated with a respective scanning unit for transmitting radiation received by the associated scanning unit to the radiation sensor which is thereby common to all of the scanning units, the transmission elements being arranged at their outlet ends in spaced relation, a masking member interposed between the outlet ends and the common radiation sensor for gating the radiation transmitted by each optical fibre transmission element so that radiation from only one transmission element at a time is incident on the radiation sensor, the masking member having an opening and being movable in a cyclic fashion to bring the opening into registry for a dwell period, one at a time, with each transmission element so that the radiation transmitted by the respective transmission element may impinge on the common sensor for that period, the masking member being arranged such that each transmission element is gated in turn to the common sensor for a period equivalent to a complete cycle of the associated scanning unit, and control circuitry so arranged that cycle completion pulses generated at the scanning units trigger indexing of the masking member from one scanning unit to the next scanning unit.

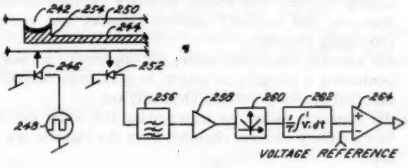


5,004,923

CAPILLARY FLOW DEVICE

Robert S. Hillman, Cupertino; Michael E. Cobb, Sunnyvale; Jimmy D. Allen, Los Altos; Ian Gibbons, Menlo Park; Vladimir E. Ostoich, San Jose, and Laura J. Winfrey, Belmont, all of Calif., assignors to Biotrack, Inc., Mountain View, Calif.

Division of Ser. No. 177,625, Apr. 5, 1988, which is a division of Ser. No. 880,793, Jul. 1, 1986, which is a continuation-in-part of Ser. No. 762,748, Aug. 5, 1985. This application Jan. 30, 1990, Ser. No. 472,130
Int. Cl.[5] G01N *21/49, 21/05*
U.S. Cl. 250—341 **5 Claims**



1. A control device capable of detecting depletion of a particle-containing fluid from a sample reservoir in a device comprising a sample reservoir and a capillary exiting said reservoir, which comprises:
a light source located so as to impinge on said fluid in said reservoir;
a light detector located in close proximity to said capillary so as to collect light which is reflected by said particles into said capillary and thereafter further reflected by said particles so as to pass out through the walls of said capillary;
a signal generator operably attached to said light source, wherein a detectable signal is imposed on the output of said light source; and
a filter operably attached to the output of said light detector,

wherein said detectable signal is isolated from other light sources which may impinge upon said light detector.

5,004,924

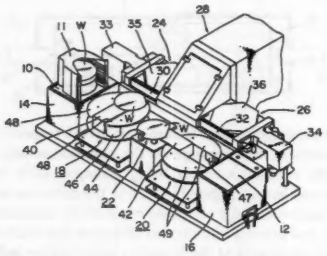
WAFER TRANSPORT APPARATUS FOR ION IMPLANTATION APPARATUS

Issei Imahashi, Tokyo, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

Continuation of Ser. No. 145,689, Jan. 15, 1988, Pat. No. 4,873,447, which is a continuation of Ser. No. 848,567, Apr. 7, 1986, abandoned. This application Mar. 9, 1989, Ser. No. 321,223

Int. Cl.[5] G21K *5/10*

U.S. Cl. 250—442.1 **6 Claims**



1. An ion implantation apparatus, comprising:

a vacuum processing chamber in which a wafer is subjected to ion implantation processing;

first and second auxiliary vacuum chambers each of which is hermetically sealable from or connectable to the outer atmosphere and vacuum processing chamber, and each of which is constructed to temporarily store the wafer;

first wafer transfer means for transferring a wafer into the vacuum processing chamber from the first auxiliary vacuum chamber;

second wafer transfer means for transferring the wafer to the second auxiliary vacuum chamber from the vacuum processing chamber;

driving means for driving the first and second wafer transfer means in a mutually synchronized manner said driving means being connected to the first and second wafer transfer means to move them at the same time so that two wafers are simultaneously transferred to the vacuum processing chamber and second auxiliary vacuum chamber from the first auxiliary vacuum chamber and vacuum processing chamber;

wafer cassette supporting means for supporting a cassette containing a plurality of wafers at a location outside of said first auxiliary vacuum chamber; and

wafer transport means for transporting the wafer into the first auxiliary vacuum chamber from the cassette one by one.

5,004,925

METHOD AND APPARATUS FOR DETECTING ALIGNMENT MARK OF SEMICONDUCTOR DEVICE

Yasushi Takahashi, Kawasaki, and Hiroshi Yasuda, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 6, 1990, Ser. No. 489,224

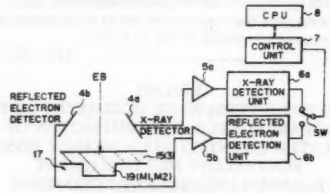
Claims priority, application Japan, Mar. 6, 1989, 1-52136

Int. Cl.[5] H01J *37/30*

U.S. Cl. 250—491.1 **19 Claims**

1. A method of detecting a flat surface alignment mark, of a semiconductor device having a main surface, the flat surface alignment mark comprising a level difference alignment mark in said main surface and a portion of a leveling metal layer on said main surface which forms a flat surface above said level-difference alignment mark common with said main surface, wherein said method comprises:

a step of irradiating and scanning charged particles onto a region of said main surface of said device encompassing said flat surface alignment mark; and



a step of detecting information generated from the region of said flat surface alignment mark in accordance with the thickness of the metal layer portion in said level difference alignment mark, so that the position of said flat surface alignment mark is detected.

5,004,926

DEVICE FOR THE IRRADIATION OF A PRODUCT ON BOTH FACES

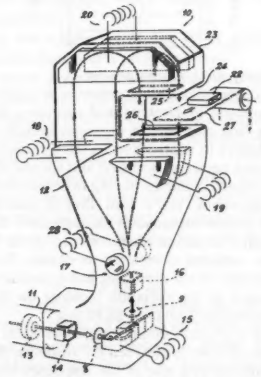
Michel Vassenaix, Sceaux, and Jacques Milcamps, Clamart, both of France, assignors to CGR MeV, Buc, France

Filed Sep. 8, 1989, Ser. No. 404,631

Claims priority, application France, Sep. 16, 1988, 88 12118

Int. Cl.[5] H01J *37/304*

U.S. Cl. 250—492.3 **3 Claims**



1. A device for the dual-faced irradiation of a product, including a charged particle accelerator associated with a modulator so as to emit a charged particle beam in pulse form, a horn-shaped, vacuum-sealed scanning chamber, said chamber having, at the widest end, an aperture occupying half of the cone, and provided with two windows transparent to the beam, said aperture being used for the passage of the product to be irradiated, said device comprising:

magnetic scanning means associated with the scanning chamber for causing an angular deflection, on either side of an axis, of the particle beam for the duration of the beam pulse;

first magnetic deflection means associated with the scanning chamber for converting the divergent angular scanning into parallel scanning;

second magnetic deflection means associated with the scanning chamber for obtaining a 180° deflection of the parallel scanning beam corresponding to that part of the scanning chamber that does not have the aperture; and

means for synchronizing both the deflection of the beam and the occurrence of the beam pulse;

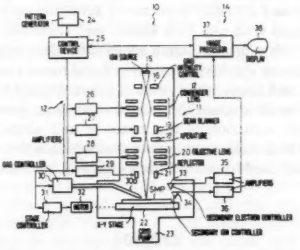
wherein the magnetic scanning means comprises a magnet with circular pole pieces, the winding of which is supplied with a current that is variable in the course of the duration of a pulse.

5,004,927

PROCESS FOR FORMING A FINE PATTERN HAVING A HIGH ASPECT RATIO

Kenji Nakagawa, Isehara, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 282,505, Dec. 12, 1988, abandoned.
This application May 25, 1990, Ser. No. 529,744
Claims priority, application Japan, Dec. 10, 1987, 62-314761
Int. Cl.[5] H01J *37/302, 37/304*
U.S. Cl. 250—492.2 20 Claims



1. A process for forming a desired, fine pattern by a focused-ion beam (FIB) system, comprising the steps of:

(a) mounting a sample in the FIB system;

(b) scanning an ion beam on the sample while supplying a reaction gas over the sample at a first scanning condition to deposit a material from the reaction gas onto the sample, the deposited material forming a first pattern including material in excess of the desired pattern and forming a sloped foot about the periphery of the desired fine pattern; and

(c) repeatedly performing a cycle comprising the following steps until the desired, fine pattern without a sloped foot along the entire periphery thereof is obtained:

(i) scanning an ion beam at least along the periphery of the first pattern at a second scanning condition to acquire an image of the first pattern;

(ii) comparing the acquired image of the first pattern with the desired, fine pattern to detect excess material of the first pattern which should be removed; and

(iii) scanning an ion beam onto said excess material of the first pattern at a third scanning condition to remove at least a part thereof, wherein said scanning at each of the second scanning condition and at the third scanning condition is performed along the entire periphery of the desired pattern at least once;

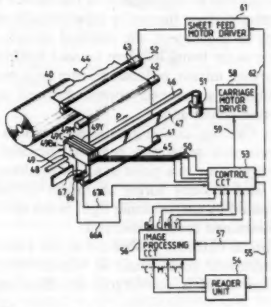
wherein said steps (b) and (c) are carried out in said FIB system.

5,004,928

PRINTING METHOD IN WHICH BOTH SIDES OF THE RECORDING SHEET ARE INSPECTED AND APPARATUS THEREFOR

Akio Suzuki, Yokohama; Yoshihiro Takada, Kawasaki; Masami Izumizaki, Tokyo, and Toshimitsu Danzuka, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 13, 1989, Ser. No. 337,376
Claims priority, application Japan, Apr. 18, 1988, 63-095063; Apr. 18, 1988, 63-095064; Apr. 18, 1988, 63-095065; Apr. 18, 1988, 63-095066; Apr. 18, 1988, 63-095067
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—559 6 Claims



1. A printing apparatus comprising:

printing means for forming an image on a recording sheet;

means for detecting an upper or lower surface of the recording sheet; and

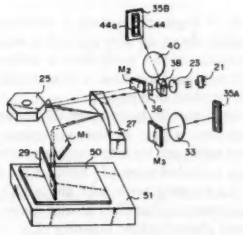
means for determining, according to a detection result of said detecting means, a recording enable state when the upper and lower surfaces of the recording sheet are properly set and a recording disable state when the upper and lower surfaces of the recording sheet are reversed.

5,004,929

OPTICAL SYSTEM FOR DETECTING THREE-DIMENSIONAL SHAPE

Yoshikazu Kakinoki, Machida; Masato Nakashima, Yokohama; Tetsuo Koezuka, Hachioji; Noriyuki Hiraoka, Kawasaki; Hiroyuki Tsukahara, Atsugi; Yoshinori Suto, Kawasaki; Yoshitaka Oshima, and Shinji Hashinami, both of Atsugi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 2, 1989, Ser. No. 360,878
Claims priority, application Japan, Jun. 4, 1988, 63-136651; Jun. 14, 1988, 63-144846; Aug. 5, 1988, 63-196815; Aug. 31, 1988, 63-218165
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—561 37 Claims



1. An optical system for detecting the shape of a three-dimensional object, comprising:

a collimating lens for converting a laser beam to a parallel beam of light;

a scanning optical system comprising:

a deflection mirror on which the parallel light beam is incident and which reflects the incident parallel beam in a predetermined direction, as a deflection beam.

a parabolic mirror on which the deflection beam is incident and which reflects the deflection beam as a scanning beam, in a direction normal to the object and incident on the object, for scanning the object with a scanning light beam spot, the scanning light beam spot being reflected by the scanned object and producing a scanned object, diffused reflection beam,

a further mirror disposed adjacent the surface of the object and with the reflecting surface thereof disposed at a predetermined, small angle of inclination with respect to the normal to the surface of the object whereby the reflecting surface thereof is substantially normal to the surface of the object, the scanned object, diffused reflection beam being incident on said further mirror and the further mirror reflecting same in a predetermined direction as a scanned object, diffused and reflected reflection beam, and

an image forming, converging lens on which the diffused and reflected reflection beam is incident and which converges same to a point in a first predetermined focal plane and thereby forms an image of the object, as illuminated by the scanning light beam spot, in the first, predetermined focal plane, and

a first optical detector positioned at the point in the first, predetermined focal plane at which the diffused and reflected beam is converged, for detecting the beam spot.

5,004,930

METHOD AND DEVICE FOR SETTING THE ANGULAR POSITION OF A WORKPIECE ON A MACHINE-TOOL BY MEANS OF A LASER BEAM

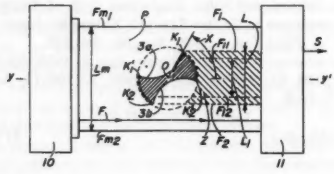
Henri Gremaud; Martial Gremaud, and Michel Rollier, all of Le Landeron, Switzerland, assignors to Francis Rollier SA, La Neuveville, Switzerland

Filed Dec. 21, 1989, Ser. No. 455,990

Claims priority, application Switzerland, Dec. 21, 1988, 04727/88

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—561 **10 Claims**



1. A method of angularly setting a workpiece (3) that is rotatably mounted about an axis (xx') of a machine-tool and wherein the position of the workpiece is defined by an angle (X), in a predetermined position corresponding to a given angle (Xl), said method comprising:

sweeping with a mobile laser beam (F) an area (P) passing through at least a part of the workpiece (3) in such a manner that said part, by intercepting said beam, produces in said area a shaded zone (Z) defined by a characteristic quantity (L) varying with said angle (X), said quantity taking a reference value (L1) at said given angle (Xl):

measuring said characteristic quantity (L);

turning said workpiece (3) about said axis (xx') until the characteristic quantity (L) reaches said reference value (L1), which corresponds to the workpiece being in said predetermined position; and

stopping the workpiece (3) in said predetermined position.

5,004,931

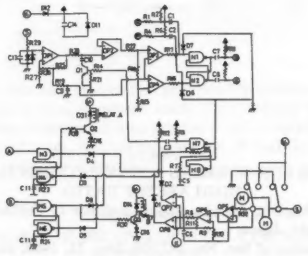
CENTRAL LOCK CONTROL SYSTEM ADAPTED FOR AUTOMOBILE

Michael Chen, Taipei, Taiwan, assignor to Advance Security Inc., Taipei, Taiwan

Filed Oct. 19, 1989, Ser. No. 424,040

Int. Cl.[5] E05B *47/00*

U.S. Cl. 307—10.2 **3 Claims**



1. A central lock control system comprising four actuators and an electronic module wherein the actuators are disposed in four doors of an automobile respectively and each actuator is operatively connected to, the lock knob of said individual door wherein the lock knob is locked or unlocked by way of a motor disposed in said actuator respectively actuating racks mechanically engaged with said lock knobs; said electronic module is equipped with a circuit therein adopted for determining clockwise or counter clockwise rotation of said motors so as to lock or unlock said doors; the system is characterized by that said electronic module takes the inductive voltage generated as a result of the actuation of the motor in said actuator by said respective lock knob as an input signal which is then amplified, rectified and used to control the locking or unlocking of other doors.

5,004,932

UNIT CIRCUIT FOR CONSTRUCTING A NEURAL NETWORK AND A SEMICONDUCTOR INTEGRATED CIRCUIT HAVING THE SAME

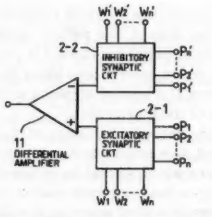
Yoshito Nejime, Hachioji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 27, 1989, Ser. No. 373,261

Claims priority, application Japan, Jul. 1, 1988, 63-162513

Int. Cl.[5] G06G *7/12*

U.S. Cl. 307—201 **19 Claims**



1. A unit circuit for constructing a neural network comprising:

a differential amplifier which includes an output terminal, an inverting input terminal and a noninverting input terminal;

an excitory synapse circuit which is connected to the noninverting input terminal of said differential amplifier; and

an inhibitory synapse circuit which is connected to the inverting input terminal of said differential amplifier,

wherein each of said excitory and inhibitory synapse circuits includes a plurality of current switches, a regulated current source array which is configured of regulated current source circuits being equal in number to the number of said current switches, said regulated current source circuits determining values of currents that flow through said current switches, and includes one load resistor which is connected to all of said current switches, and

wherein input terminals of each synapse circuit are responsive to inputs which turn "on" and "off" the respective current switches and to which input terminals external inputs or outputs of other unit circuits are applied, said regulated current source circuits having current values which can be respectively altered by voltages externally applied independently of one another.

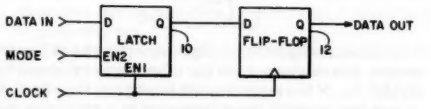
5,004,933
PHASE-SELECTABLE FLIP-FLOP

Glenn F. Widener, Hillsboro, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 869,788, Jun. 2, 1986, abandoned. This application Sep. 18, 1987, Ser. No. 98,701

Int. Cl.[5] H03K *5/135*

U.S. Cl. 307—269 **2 Claims**



1. A phase-selectable flip-flop comprising:

an input transparent latch having a data input, a data output, and two enable inputs, a clock being applied to one enable input and a command being applied to the other enable input; and

a flip-flop connected to the data output of the input transparent latch, the flip-flop being clocked by the clock, such that when the command is in a first state the input transparent latch is held transparent and the output of the phase-selectable flip-flop is that data clocked into the flip-flop on the rising edge of the clock, and when the command is in a second state the output of the phase-selectable flip-flop is that data latched by the input transparent latch on the falling edge of the clock and clocked into the flip-flop on the next rising edge of the clock.

5,004,934
SEMICONDUCTOR INTEGRATED CIRCUIT AND TEST METHOD FOR CHARACTERISTICS

Kouichi Furuta, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 27, 1989, Ser. No. 302,469

Claims priority, application Japan, Jan. 27, 1988, 63-16502

Int. Cl.[5] H03K *3/33, 3/335*

U.S. Cl. 307—303 **14 Claims**

1. A semiconductor integrated circuit comprising:

a first connecting terminal operatively connected to,

a first signal processing circuit for receiving a signal from the first connecting terminal to perform a predetermined function,

a second connecting terminal connected to the first signal processing circuit for supplying means for setting to a predetermined first level a signal during the predetermined function of the first signal processing circuit,

a third connecting terminal,

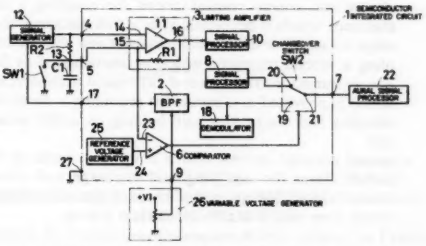
a second signal processing circuit for generating a signal by performing a predetermined function,

a fourth connecting terminal,

a changing circuit that has characteristics that can be changed so as to have a characteristic corresponding to a signal given to the fourth connecting terminal,

a switch for selectively connecting the outputs of the second signal processing circuit and changing circuit in response to a control signal to apply signals to the third connecting terminal, and

control signal generating means for responding to a signal applied to the second connecting terminal, for applying a



control signal to the switch for actuating the switch to set the switch in a first mode in order to apply the output of the second signal processing circuit to the third connecting terminal when the second connecting terminal is at the predetermined first level, and also in a second mode to change the switch in order to apply an output of the changing circuit to the third connecting terminal when the second connecting terminal is at a predetermined second level.

5,004,935
SAMPLE AND HOLD CIRCUIT

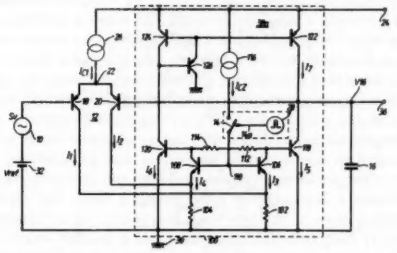
Akihiro Murayama, Yokohama, and Takeshi Koyama, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 402,455, Sep. 5, 1989, abandoned, which is a continuation of Ser. No. 186,305, Apr. 26, 1988, abandoned. This application Mar. 21, 1990, Ser. No. 500,091

Claims priority, application Japan, Apr. 28, 1987, 62-103245

Int. Cl.[5] G11C *27/02*

U.S. Cl. 307—353 **12 Claims**



1. A sample and hold circuit for sampling an input signal having a variable input voltage, comprising:

input means for supplying the input signal;

holding capacitor means for storing a charge voltage in response to a charge current supplied thereto when a charge voltage stored previously therein is lower than the input voltage and for producing a discharge current when the previous stored charge voltage is higher than the input voltage;

differential circuit means having a first differential transistor and a second differential transistor for comparing the voltage levels of the input voltage and the charge voltage, and generating a differential current in response thereto;

first constant current source connected to said differential circuit means for supplying a constant current thereto;

current amplifier means for generating the charge current in response to the differential current when the previous stored charge voltage is lower than the input voltage and for amplifying the discharge current when the previous stored charge voltage is higher than the input voltage;

a switch means for selectively activating and deactivating the current amplifier means; and

wherein the current amplifier means further includes a discharge and charge control circuit for coupling a first transistor which is denominated as a first discharge transistor, to said first differential transistor and also for coupling a second transistor which is denominated as first charge transistor to said second differential transistor, and which is provided as a means for providing a means for charging and discharging said holding capacitor means, and

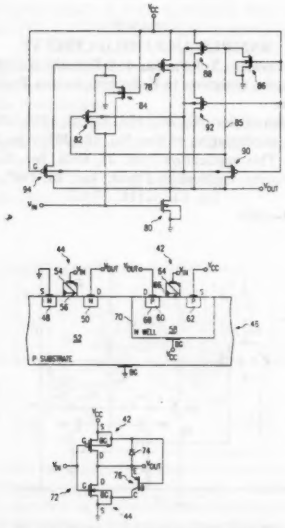
a second constant current source coupled in series to the switch means for supplying said discharge and charge control circuit with a second constant current independently from said first constant current source.

5,004,936

NON-LOADING OUTPUT DRIVER CIRCUIT

Bernhard H. Andresen, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 31, 1989, Ser. No. 332,261
Int. Cl.[5] H03K *19/003, 19/094, 17/16, 17/687*
U.S. Cl. 307—443 **30 Claims**



1. A non-loading output driver circuit for supplying an output signal to a data bus, wherein the data bus may be active when the output driver circuit is inactive, comprising:

output signal circuitry including:

a first semiconductor region of a first conductivity type electrically coupled to an output terminal for supplying the output signal to the data bus; and

a second semiconductor region of a second conductivity type adjacent said first semiconductor region and coupled to a reference voltage level, wherein forward biasing said first semiconductor region with respect to said second semiconductor region creates a conduction path between said first and second semiconductor regions; and

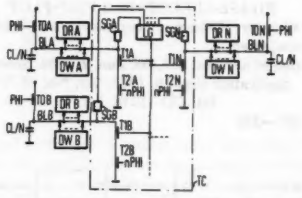
switching circuitry for alternatively connecting said reference voltage level between a supply voltage signal and the output signal.

5,004,937

CIRCUIT CONFIGURATION FOR ACCELERATED CHARGE REVERSAL OF THE VOLTAGE LEVEL OF A BUS LINE OF AN INTEGRATED CIRCUIT

Antonio M. d. A. de Oliveira, Munich, and Jakob Staerk, Karlsfeld, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 26, 1988, Ser. No. 186,374
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1987, 3714134; Dec. 23, 1987, 3743932
Int. Cl.[5] H03K *17/16, 19/003*
U.S. Cl. 307—443 **2 Claims**



1. Circuit configuration, comprising a plurality of data transmitters, data receivers, a bus line of an integrated circuit being divided into N line segments each having a voltage level, each of said line segments being connected to a respective one of said data transmitters and to a respective one of said data receivers for data transmission between said data transmitters and said data receivers, said bus line being charged to a predetermined electrical voltage level during a pre-charging phase, and said bus line having a voltage level being left as is or reversed within a charge reversal period during a data transmission phase in accordance with digital data to be transmitted, a trigger circuit connected to said bus line for accelerated charge reversal of said bus line, said trigger circuit effecting an additional, accelerated discharging or charging of said bus line upon attainment of a predetermined trigger level, said trigger circuit including a logic gate having a plurality of inputs and an output, a plurality of switch elements each being connected between a respective one of said N line segments of said bus line and a respective one of said inputs of said logic gate for comparing the trigger level with said voltage level on said line segment, and discharge transistors being connected to and triggered by said output of said logic gate for rapid individual charge reversal of each of said line segments.

5,004,938

MOS ANALOG NOR AMPLIFIER AND CURRENT SOURCE THEREFOR

Sheau-Jiung Lee, Taipei, China, assignor to Acer Incorporated, Taipei, Taiwan

Filed Mar. 3, 1989, Ser. No. 318,383
Int. Cl.[5] H03K *19/003*
U.S. Cl. 307—448 **10 Claims**

1. An MOS analog NOR amplifier comprising:

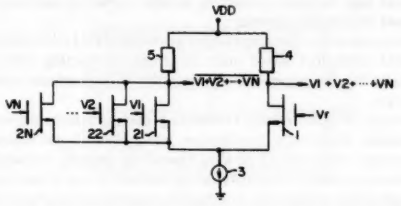
a constant current source;

a reference MOS transistor having a source, a gate and a drain terminal, wherein the source terminal of said reference MOS transistor is connected to a first terminal of said constant current source, said gate terminal is connected to a constant reference voltage and said drain terminal is connected to a first terminal of a first pull-up means; and

a plurality of input MOS transistors each of which has a source, a gate and a drain terminal, wherein the source

terminal of each of said input MOS transistors is connected to said first terminal of said constant current source and the drain terminal of the same is connected to a first terminal of a second pull-up means;

wherein in response to a logic "1" or a logic "0" signal applied at the gate terminal of each of said input MOS transistors, an output signal is generated at the drain terminals of said plurality of input MOS transistors which is the same response as that of a standard NOR gate and an



output signal is generated at the drain terminal of said reference MOS transistor which is the same response as that of a standard OR gate; and

wherein said reference MOS transistor and said plurality of input MOS transistors are NMOS transistors, and said first and second pull-up means are PMOS transistors with respective second terminals thereof being coupled to a V_{DD} source; and

wherein a second terminal of said constant current source is connected to ground.

5,004,939

CMOS-ECL CONVERTER

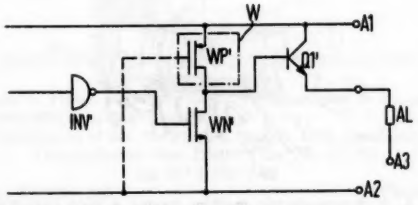
Michael Stegherr, Neubiberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 17, 1990, Ser. No. 524,443

Claims priority, application Fed. Rep. of Germany, May 30, 1989, 3917538

Int. Cl.[5] H03K *17/30, 19/17*

U.S. Cl. 307—475 **8 Claims**



8. A CMOS-ECL converter comprising:

an input, an output, and first, second and third terminals for voltage supply;

said first terminal connected to a reference potential, said third terminal connected to a potential that is negative with respect to the reference potential, and said second terminal connected to a potential that is negative with respect to the voltage potential at said third terminal;

first and second field-effect transistors, said first field-effect transistor being an n-channel field-effect transistor and said second field-effect transistor being a p-channel field effect transistor, each of said field-effect transistors including a controlled current path and a gate, said gate of said first field effect transistor connected to said input, said controlled current paths connected in series between said first and second terminals for voltage supply, and said gate of said second field-effect transistor connected to the second terminal for voltage supply;

an npn bipolar output transistor including a base connected to the junction of said controlled current paths of said first and second field-effect transistors, a collector connected to the first terminal for a voltage supply, and an emitter connected to said output; and

a load connected between said output and said third terminal for voltage supply.

5,004,940

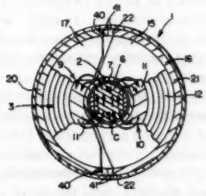
DIRECT DRIVE VALVE FORCE MOTOR WITH GAIN SHAPING PROVISION

Robert D. Vanderlaan, Kalamazoo, Mich., assignor to Pneumo Abex Corporation, Boston, Mass.

Filed Sep. 21, 1987, Ser. No. 98,075

Int. Cl.[5] H02K *33/12*

U.S. Cl. 310—36 **23 Claims**



1. A limited angle torque motor comprising a rotor assembly, a stator assembly surrounding said rotor assembly, said rotor assembly and stator assembly being mounted for relative rotation, said rotor assembly including permanent magnet means magnetized in the diametrical direction, and said stator assembly including circumferentially spaced stator magnetic poles, stator coil means wrapped about said magnetic poles which when excited by direct or pulse width modulated current produce a cross flux between said stator assembly and rotor magnet means causes said rotor assembly to rotate relative to said stator assembly through a limited rotational angle range, an outer magnetic housing surrounding said stator coil means defining a magnetic return path for the magnetic field with is produced when said stator coil means is excited, air gap means in said magnetic return path which causes the magnetic flux produced by said permanent magnet means to follow a primary magnetic flux path from said permanent magnet means through said stator magnetic poles that produces a magnetic reluctance torque urging said rotor assembly to a null position, and means defining a secondary magnetic flux path of relatively small cross-section area compared to said primary magnetic flux path from said permanent magnet means through said stator magnetic poles and magnetic housing that increases the rotational and torque gains in a localized area about such null position, said means defining a secondary magnetic flux path comprising magnetic means for bridging said air gap means at one or more points along the length of said air gap means, said magnetic means having a relatively small cross-sectional area which becomes saturated at a specified level of applied current, whereby increases in current above such specified level will be redirected into said primary magnetic flux path to provide reduced rotational and torque gains at higher current levels outside such null position.

5,004,941

STEPPER MOTOR WITH INPUT CONNECTOR ARRAY

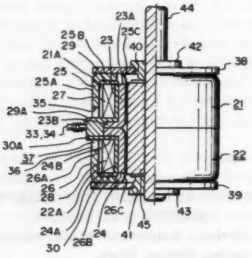
Yoshiyuki Ohzeki, and Kazuo Amikura, both of Tokyo, Japan, assignors to Copal Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1989, Ser. No. 447,225

Claims priority, application Japan, Dec. 9, 1988, 63-160208[U]

Int. Cl.[5] H02K *1/18, 19/02*

U.S. Cl. 310—49 R 6 Claims



4. A stepper motor comprising:

a. a rotor made of magnetic material;

b. a rotatable output shaft having said rotor mounted thereon;

c. a pair of stator units, each comprising:

i. a first yoke having an axially elongated cylindrical portion including circumferentially spaced, axially elongated magnetic pole pieces annularly positioned about said output shaft and a radially outwardly extending annular ring-shaped portion;

ii. a second yoke including a generally cylindrical wall portion of greater diameter than said cylindrical portion of said first yoke defining a cylindrical exterior of said stator unit and a radially inwardly extending annular portion having magnetic pole pieces in spaced alternating arrangement with said magnetic pole pieces of said first yoke;

iii. a bobbin retained between said cylindrical portion of said first yoke and said radial portion of said second yoke, said bobbin including:

(1) a generally cylindrical axially elongated core;

(2) a pair of planar radially extending annular flanges on respective axial ends of said core;

(a) an outwardly facing surface of said flange which is farther from said remaining stator unit of said pair being in facing complemental contact with said radially extending portion of said second yoke;

(b) a radially outwardly facing edge of said flange which is farther from said remaining stator unit of said pair being in facing complemental contact with said cylindrical wall portion of said second yoke;

(c) an inner annular surface of said cylindrical core being in facing complemental contact with said cylindrical portion of said first yoke;

(d) said flange which is closer to said remaining stator unit of said pair

(i) facingly contacting said radially outwardly extending annular ring-shaped portion of said first yoke;

(ii) having a solid rectangular lug formed integrally therewith, said lug extending radially outwardly from said flange and extending axially from an axially outwardly facing surface of said flange axially away from said flange;

(3) conductor placed about said bobbin core;

d. said stator units adjoining by

i. respective axially facing surfaces of said annular ring-shaped portions of said first yokes facingly contacting one another;

ii. respective exterior cylindrical surfaces of said cylindrical wall portions of said second yokes contacting one with another to define a generally closed cylindrical exterior of said stepper motor;

e. said rectangular lugs of said respective bobbins of said respective stator units protruding through a common rectangular opening in said generally closed cylindrical exterior of said stepper motor;

f. said lugs of said respective bobbins being in facing complemental contact along lug planar surfaces perpendicular to the output shaft;

g. axially extending angularly outwardly facing end surfaces of said lugs facingly contacting axially extending surfaces of said rectangular opening;

h. respective annular ring-shaped portions of said first yokes of said respective stator units abuttingly contacting substantially the entirety of radially inwardly facing surfaces of said lugs;

i. means for electrically connecting said annularly disposed sinous electrically conductive material with an external source of electrical power, extending radially outwardly from a radially outwardly facing surface of one of said lugs;

j. said sinous electrically conductive material annularly would about said bobbin core connected to connecting means extending from said lug which are integral with said respective bobbins independently of connection of said stator units.

5,004,942

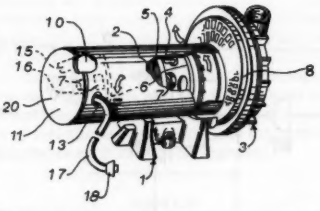
POWER AND CONTROL CHAMBER FOR DYNAMOELECTRIC MACHINES

James L. King, Troy, Ohio, assignor to A. O. Smith Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 306,887, Feb. 6, 1989, abandoned. This application Nov. 6, 1989, Ser. No. 432,173

Int. Cl.[5] H02K *9/00;* F28F *9/02*

U.S. Cl. 310—89 18 Claims

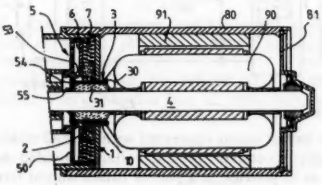


1. A dynamoelectric machine having a main cylindrical frame supporting a stator unit and a rotor unit within said stator unit, comprising an integrated power and control compartment secured to one end of said motor frame and forming an extension of said cylindrical motor frame, a plurality of power and control components mounted within said compartment and interconnected to each other and to the motor windings, said compartment defining a substantially sealed enclosure for protecting of the electrical connections and components therein from the surrounding environment, an opening within one wall of said compartment, a door unit releasably secured within said opening and effectively sealing said opening, at least one of said power and control components mounted to the interior surface of, said door unit and providing direct access to said component on said door unit upon removal of said door unit.

5,004,943
BRUSH HOLDER DEVICE FOR AN ELECTRIC MOTOR HAVING A ROTATABLE COMMUTATOR

Georges Gagneux, Chatellerault, France, assignor to Valeo Systemes d'Essuyage, Montigny-le-Bretonneux, France

Filed Aug. 21, 1990, Ser. No. 570,612
Claims priority, application France, Sep. 5, 1989, 8911585
Int. Cl.[5] H01R *39/38*; H02K *5/14, 15/00*
U.S. Cl. 310—239 **8 Claims**



1. For an electric motor having a shaft and a commutator fixed on said shaft, a brush holder device comprising:

a support for brushes, having a central passage whereby to allow the said commutator to be introduced in line with the brushes,

resilient biassing means carried by the said brush support for biassing the brushes towards the passage, and

stop means carried by the said brush support for holding the said brushes in a position spaced away from the said central passage for the introduction of the commutator into the passage, and for releasing the said brushes after the commutator has been mounted in position so as to allow them to come into cooperating contact with the said commutator,

wherein the stop means comprise a cover member having a base, adapted to be secured with respect to the said brush support, and defining therein an opening which is coaxial with the said central passage, a generally frusto conical foldable wall extending the said base and adapted to be folded back on itself, and an annular end face, for surrounding the motor shaft and being joined to the said foldable wall, with the said foldable wall being adapted to hold the said brushes in the said spaced-away position, and to release them after it has been folded back due to the axial displacement of the said annular end face which is brought about by the introduction of the commutator into the said passage.

5,004,944
LIGHTWEIGHT HIGH POWER ELECTROMAGNETIC TRANSDUCER

Gene A. Fisher, Highlands Ranch, Colo., assignor to Unique Mobility, Inc., Englewood, Colo.

Continuation of Ser. No. 812,306, Dec. 23, 1985, abandoned.
This application Nov. 27, 1987, Ser. No. 125,781
Int. Cl.[5] H02K *1/22*
U.S. Cl. 310—266 **4 Claims**

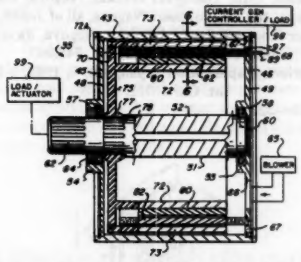
1. A brushless, high-speed, high torque electric motor, comprising:

a housing:

a shaft mounted on said housing to rotate relative thereto;

a magnetic field-generating rotor secured to said shaft to rotate therewith, said rotor having a mounting disk connected to said shaft and one of (i) a first annular wall means having a first magnetic means mounted thereon for generating a magnetic flux and (ii) a second annular wall means comprising an outer annular wall and an inner annular wall both supported by said mounting disk and spaced radially apart to define an annular gap therebetween, said inner annular wall being spaced radially apart from said shaft, and a second magnetic means for generating a magnetic flux mounted on at least one of said inner annular wall and said outer wall; and

an armature, for intercepting said magnetic flux, fixed to said housing, said armature comprising an annular member positioned to be disposed one of (i) radially adjacent said first annular wall means and (ii) at least partially within said gap between said inner annular wall and said outer wall of said rotor, said armature including (i) a plurality of spaced sections of electrical conductors, each section

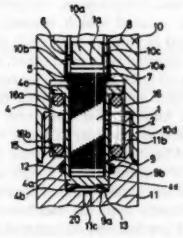


including a plurality of separate conductive wires insulated from each other and (ii) a plurality of magnetic flux carrying elements interposed between said sections of electrical conductors, each flux carrying element comprising a member pressed from highly magnetically permeable particles and a binder material for binding said particles together.

5,004,945
PIEZOELECTRIC TYPE ACTUATOR

Masahiro Tomita, Anjo; Satoshi Hayashi, Kuwana; Shinro Oda, Kuwana; Akira Fujii, Kuwana, and Masayoshi Tanigawa, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 22, 1989, Ser. No. 410,525
Claims priority, application Japan, Sep. 26, 1988, 63-239949
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—328 **14 Claims**



1. A piezoelectric type actuator comprising:

a piezoelectric laminate comprising alternately superimposed piezoelectric plates as piezoelectric elements and metallic electrode plates;

a first spring means for exerting a compressive force on said piezoelectric laminate and having a relatively small spring constant and relatively long effective stroke;

a second spring means for exerting a compressive force on said piezoelectric laminate and having a relatively large spring constant and relatively short effective stroke;

said first spring means and second spring means being positioned in parallel with each other, and positioned so that an expanding stroke of said first spring means is equal to an expanding stroke of said second spring means when a length of said piezoelectric laminate after deforming is less than a maximum expanding length of said second spring means, so that the compressive force caused by said second spring means is dominant, and the compressive force caused by said first spring means becomes dominant when

the length of said piezoelectric laminate after deforming exceeds the maximum expanding length of said second spring means,

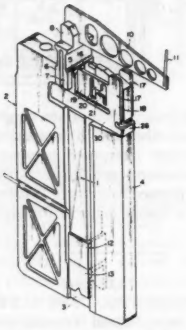
---

5,004,946

PARALLEL FOUR-LINK MECHANISM

Atsuo Sakaida, Gifu; Yoshiyuki Ikezaki, Nagoya; Akira Iriguchi, Nagoya, and Toshio Inose, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jul. 5, 1990, Ser. No. 548,097
Claims priority, application Japan, Jul. 6, 1989, 1-175162
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—328 8 Claims



1. A parallel four-link mechanism integrally formed by a predetermined elastic material, adapted to be positioned in a motion conversion mechanism for converting mechanical expansion and compression of a predetermined material in a predetermined direction to a motion in the desired direction, for regulating the mechanical expansion and compression so as not to be skewed from said predetermined direction by means of the elastic deformation therof in accordance with the mechanical expansion and compression, comprising a pair of plate portions oppositely located which respectively include one pair of links arranged in parallel with each other, another pair of links arranged in parallel with each other, and hinge sections provided between said links adjacently located for respectively connecting said links, said parallel four-link mechanism is arranged in such a manner that the stress generated on the opposed inner surfaces of one pair of hinge sections which are diagonally disposed becomes smaller than that generated on the outer surfaces of another pair of hinge sections which are diagonally disposed when said parallel four-link mechanism is deformed in accordance with the mechanical expansion and compression of said predetermined material.

5,004,947

FLUORESCENT LAMP BALLAST WITH HIGH POWER FACTOR

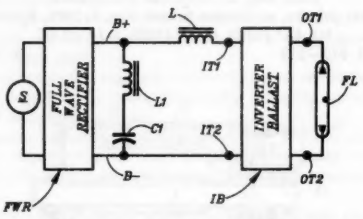
Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010

Continuation of Ser. No. 820,120, Jan. 21, 1986, abandoned. This application Oct. 31, 1989, Ser. No. 430,900
Int. Cl.[5] H04B *41/14*
U.S. Cl. 315—224 12 Claims

1. A ballast means adapted to be powered from the AC voltage on an ordinary electric utility power line and operative to power a gas discharge lamp, comprising:

rectifier means operative to connect with the power line and to provide a unidirectional current at a pair of DC terminals; a DC voltage being present across the DC terminals;

L-C circuit means connected with the DC terminals and operative to provide an effective short circuit across the DC terminals for any current having frequency about equal to twice the frequency of the AC voltage, thereby to cause the DC voltage to have an instantaneous absolute magnitude that is substantially equal to that of said AC voltage over at least half of the total duration of each half-cycle of this AC voltage; and



inverter ballast means connected with the DC terminals and operative to convert the DC voltage provided therefrom such as to provide at a pair of ballast output terminals a magnitude-limited alternating current for powering a gas discharge lamp.

5,004,948

LUMINESCENT MATERIAL, ESPECIALLY FOR APPLICATION IN MERCURY VAPOR GAS DISCHARGE LIGHT SOURCES, AND MERCURY VAPOR GAS DISCHARGE LIGHT SOURCE

Péter Kinczel; László Balázs, and Gábor Sajó, all of Budapest, Hungary, assignors to Tungsram Reszvenytarsasag (Tungsram RT), Budapest, Hungary

Filed Mar. 22, 1989, Ser. No. 327,326
Claims priority, application Hungary, Mar. 28, 1988, 1532/88
Int. Cl.[5] H01J *63/04*
U.S. Cl. 313—486 14 Claims

1. A luminescent material, especially for application in mercury vapor gas discharge light sources, comprising

a first component for luminescing red light under influence of incident optical radiation and

a second component for luminescing under influence of said incident optical radiation in the spectral range from 520 to 560 nm including colors from green to yellow, said second component including

a first phase of garnet crystallization system consisted of yttrium aluminate activated by trivalent cerium and determined by the general structural formula

$$Y_{3-a}Ce_aAl_5O_{12}$$

wherein the value of the index a lies in the range $0.0003 < a < 0.1$, and

a second phase of hexagonal crystallization system consisted of a mixed rare earth aluminate of general structural formula

$La_bCe_{1-b}Al_{11}O_{18}$

wherein the value of the index b lies in the range $0<b<1$, and

said second phase is present in an amount ranging from the amounts detectable by means of X-ray diffractometry to the double amount of said first phase.

5,004,949

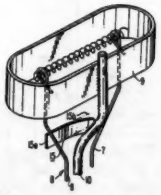
FLUORESCENT LAMP WITH GROUNDED ELECTRODE GUARD

Frank M. Latassa, Morgantown, and Thomas O. Leyh, Bridgeport, both of W. Va., assignors to North American Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 200,382, May 31, 1988, Pat. No. 4,891,551. This application Dec. 22, 1989, Ser. No. 456,027

Int. Cl.[5] H01J *61/10*

U.S. Cl. 313—492 **6 Claims**



1. In a fluorescent lamp having an electrode, a conductive element for supplying voltage to said electrode, and a metallic guard partially surrounding said electrode for shielding material ejected from said electrode, a discharge arc being maintained in said lamp during lamp operation, the improvement comprising:

a bimetal strip for electrically connecting said conductive element and said metallic guard during lamp operation, said bimetal strip being arranged such that upon starting of said lamp heat from said discharge arc causes said strip to bend and electrically connect said conductive element and said metallic guard for maintaining said metallic guard and said electrode at the same potential during lamp operation irrespective of electrode polarity.

5,004,950

PLASMA DISPLAY PANEL ARRANGED WITH AUXILIARY ELECTRODE

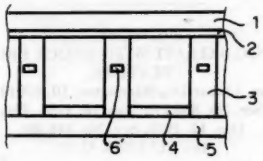
Seung-Woo Lee, Seoul, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Kyonggi, Rep. of Korea

Filed Sep. 6, 1989, Ser. No. 403,345

Claims priority, application Rep. of Korea, Sep. 16, 1988, 88-15299

Int. Cl.[5] H01J *17/49*

U.S. Cl. 313—582 **4 Claims**



1. In a plasma display panel having front and rear substrates supported in spaced relationship from each other to define a gap therebetween, said substrates having opposed surfaces which face each other across said gap, an anode and a cathode formed respectively on said substrate surfaces, means for creating a seal between said substrates so that said gap is sealed, a quantity of gas confined in said sealed gap, means for effecting a voltage differential between said anode and said cathode which is sufficient to cause movement of ions in a first direction across said gap from said anode to said cathode, and auxiliary electrode means disposed in said gap for permitting introduction of priming ions into said gap before said voltage differential is effected between said anode and said cathode, the improvement comprising:

means operable while said voltage differential exists between said anode and said cathode for producing in said gap an electric field which forcibly urges ions in said gap in a second direction approximately perpendicular to said first direction, said electric field producing means including means for applying an AC voltage to said auxiliary electrode means while said voltage differential exists between said anode and said cathode.

5,004,951

SINGLE SIDE-SEALED METAL VAPOR DISCHARGE LAMP

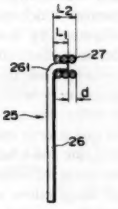
Kazuo Honda, Hiratsuka; Atsushi Matsuura, Yokohama, and Hisanori Sano, Yokosuka, all of Japan, assignors to Toshiba Lighting & Technology Corporation, Tokyo, Japan

Filed Jan. 26, 1990, Ser. No. 470,681

Claims priority, application Japan, Jan. 31, 1989, 1-21054; Mar. 31, 1989, 1-83647; Mar. 31, 1989, 1-83652

Int. Cl.[5] H01J *61/00, 61/04*

U.S. Cl. 313—631 **10 Claims**



1. A single side-sealed metal vapor discharge lamp comprising:

an arc tube having a sealed section at one end and an envelope at the other end, the envelope defining a discharge region containing a rare gas for starting and a filled gas containing mercury and light emitting metal;

a pair of metal foils sealed in the sealed section; and

a pair of electrode means each comprised of a rod and a coil mounted on a forward end portion of the rod, the rod being inserted at one end into the sealed section and connected to the corresponding metal foil and the other end portions of the rods being bent and situated opposite to each other in the discharge region, and the coils of the electrode means being mounted on the bent forward end portions of the rods by at least one turn, situated, opposed to each other in the discharge region, and made of a higer melting point material than a surface material of the bent forward end portions of the rods, where the following inequalities are satisfied:

$$L1 \leqq 3d$$

$$d/2 \leqq L2 - L1 \leqq 3d$$

where

L1: the length from the bent portion to the forward end of the electrode rod;

L2: the length of the coil; and

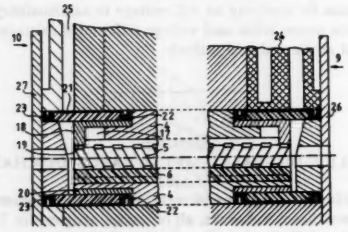
d: the wire diameter of the coil.

5,004,952

VACUUM-TIGHT WINDOW FOR MICROWAVE ELECTRON TUBE AND TRAVELLING WAVE TUBE INCLUDING THIS WINDOW

Jacques Tikes, Orsay; Joel Le Fur, Chilly-Mazarin, and Pierre Nugues, Auneaux, all of France, assignors to Thomson-CSF, Puteaux, France

Filed Nov. 3, 1989, Ser. No. 431,390
Claims priority, application France, Nov. 4, 1988, 8814417
Int. Cl.[5] H01J 23/42
U.S. Cl. 315—3.5 6 Claims



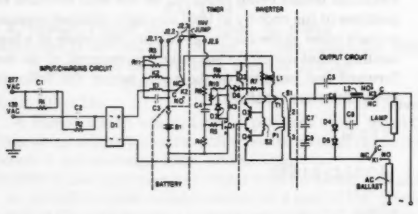
1. A vacuum-tight window for a microwave electron tube, said tube comprising, firstly, a zone under vacuum, form by a source of electrons, a focusing unit called a "delay line" and a collector of electrons and, secondly, at least one external transmission circuit through which a microwave signal interferes with the beam of electrons crossing said delay line, which is cylindrical, wherein said vacuum-tight window is cylindrical and is coaxial with a chamber which encases the delay line, and integrated with said chamber by brazing and wherein said window is made of ceramic material transparent to microwaves and further comprising a metallic flexible ring at each of the ends of said ceramic cylinder with a first ring being brazed to the chamber of the delay line and the second ring being brazed to at least one of said source and a collector sub-assembly coaxial with the delay line and wherein a microwave transmission antenna in the form of a metallic cylinder passes through the ceramic of the window with said antenna being formed by a metallic strip connected, at right angles, to said metallic cylinder which fits a clearance inserted in the chamber.

5,004,953

EMERGENCY LIGHTING BALLAST FOR COMPACT FLUORESCENT LAMPS WITH INTEGRAL STARTERS

Charles W. McDonald, Memphis, Tenn., assignor to The Bodine Company, Collierville, Tenn.

Filed Jun. 30, 1989, Ser. No. 374,451
Int. Cl.[5] H05B 37/00
U.S. Cl. 315—86 11 Claims



1. A method for operating a fluorescent lamp having a starter with power supplied by a battery comprising:

generating an alternating current from energy supplied by the battery;

supplying the alternating current as a starting current to the lamp for a selected period of time; and

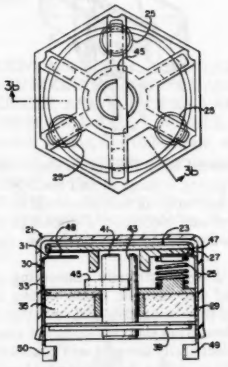
at the end of the selected period of time, generating a direct current from the alternating current by effecting half-wave rectification of the alternating current, and supplying the direct current to the lamp in place of the alternating current.

5,004,954

CURRENT SENSING RELAY

Lawrence P. Kleven, Attleboro; Edward A. Agranat, Weston; Jerry Crisafulli, Brookline; Hugh Robinson, Wenham; David J. Smith, Needham; Thomas Wiseley, Acton; Richard C. Fortier, Concord; Severne Johnson, Seattle, and Marvin Menzin, Lexington, all of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 21, 1989, Ser. No. 454,592
Int. Cl.[5] H05B 41/36; H01H 63/10, 67/00
U.S. Cl. 315—106 36 Claims



1. A relay for disconnecting fluorescent lamp filaments from the associated filament circuit, which comprises, in combination:

(a) a housing,

(b) a magnetic flux producing device disposed within said housing,

(c) slug means disposed within said housing and movable toward said magnetic flux producing device in response to magnetic flux from said magnetic flux producing device, and

(d) a plurality of switches within said housing, each said switch including a contact and a contact terminal, said slug means normally biasing each said contact against its associated contact terminal to maintain each of said switches in the normally closed state.

5,004,955

ELECTRONIC BALLAST WITH SHOCK PROTECTION FEATURE

Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010

Division of Ser. No. 830,270, Feb. 18, 1986. This application Dec. 12, 1989, Ser. No. 448,880
Int. Cl.[5] H05B 41/29
U.S. Cl. 315—119 11 Claims

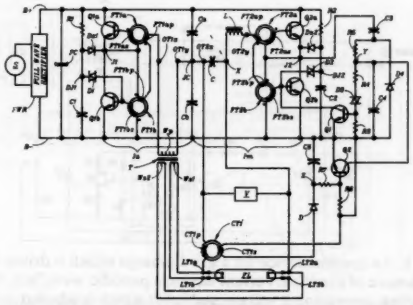
1. A combination comprising:

an AC current source powered from a DC voltage and operable, except after having been provided with a disable signal at a set of disable terminals, to provide an AC output current from a pair of output terminals;

gas discharge lamp connected with the output terminals and normally operative to constitute an adequate load for the

AC current source, thereby to cause the magnitude of the voltage across the output terminals to stay below a first level for as long as the lamp is indeed so operative;

voltage-limiting means effectively connected across the output terminals and operative, in case the lamp were to fail to constitute said adequate load, to prevent the magnitude of the voltage between the output terminals from exceeding a second level, the second level being (i) higher than the first level, and (ii) substantially independent of the magnitude of the DC voltage; and



control means connected in circuit between the output terminals and the disable terminals, the control means being operative: (i) to sense the presence of the AC output current when it is flowing through the lamp, and (ii) to provide said disable signal in case the AC output current were to fail to flow through the lamp for longer than a brief period of time;

thereby to prevent the voltage-limiting means from having to absorb power for longer than this brief period.

5,004,956

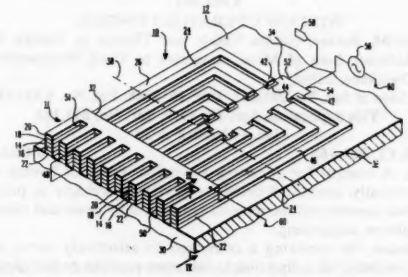
THIN FILM ELECTROLUMINESCENT EDGE EMITTER STRUCTURE ON A SILCON SUBSTRATE

Zoltan K. Kun, Churchill Boro; Michael W. Cresswell, Plum Boro, and Richard H. Hopkins, Murrysville Boro, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 235,143, Aug. 23, 1988. This application Nov. 18, 1988, Ser. No. 273,296

Int. Cl.[5] G09G *3/10;* **H01J** *7/62, 63/04*

U.S. Cl. 315—169.3 **2 Claims**



1. A thin film electroluminescent edge emitter assembly comprising:

(a) a substrate having a configuration to define a top surface and at least one lateral edge surface;

(b) at least one integrated circuit being composed of semiconductor material and formed within an interior portion of said substrate, said integrated circuit having a logic signal input, an excitation voltage input, a plurality of output leads and internal means for providing an excitation voltage from said excitation voltage input to selected output leads in response to preselected logic signals provided to said internal means at said logic signal input; and

(c) a plurality of pixels formed on said top surface of said substrate and being defined by a composite laminar structure which includes a plurality of laterally-spaced, longitudinally-extending control electrodes disposed either upon said top surface or within the interior of said substrate, a dielectric layer disposed above said substrate and on said plurality of control electrodes, a common electrode layer disposed above said dielectric layer, and a phosphor layer interposed between said dielectric layer and said common electrode layer;

(d) each of said plurality of pixels having a light-emitting face located adjacent said substrate lateral edge surface of said substrate and including one control electrode having one end terminating adjacent said lateral edge and its other opposite end connected to one of said output leads of said integrated circuit;

(e) selected ones of said pixels being responsive to said excitation voltage provided to said selected control electrodes from said integrated circuit via said output leads thereof to radiate a light signal emitted at said selected pixels light-emitting faces.

5,004,957

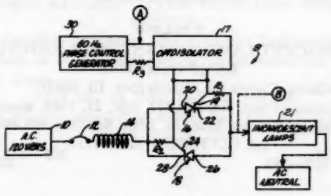
DIMMING CONTROL CIRCUIT

David W. Cunningham, Los Angeles, Calif., assignor to Lee Colortran, Inc., Burbank, Calif.

Filed Jan. 6, 1989, Ser. No. 294,378

Int. Cl.[5] H05B *37/02*

U.S. Cl. 315—199 **18 Claims**



1. A dimming circuit for lighting devices comprising:

a pair of silicon controlled rectifiers (SCR) connected in parallel opposed circuit relation, each SCR having a control electrode,

a phase control signal generator connected to the control electrode of each SCR for switching the SCR on and off,

a source of electric power connected to the input to the dimming circuit,

inductive means connected in series circuit relationship with the source of power and the pair of SCR's, and

means for controlling the signal generator such that one or both of the SCR's are turned on and off by means of pulses from the generator having a frequency of approximately 50–60 Hz and a predetermined pulse duration to control the intensity of the light provided by the lighting devices and to suppress the acoustic noise generated by the lighting devices.

5,004,958

STROBE APPARATUS

Shinji Hirata, Toyonaka, Japan, assignor to West Electric Company, Ltd., Osaka, Japan

Filed Aug. 2, 1989, Ser. No. 388,378

Claims priority, application Japan, Aug. 3, 1988, 63-193784

Int. Cl.[5] H05B *41/14*

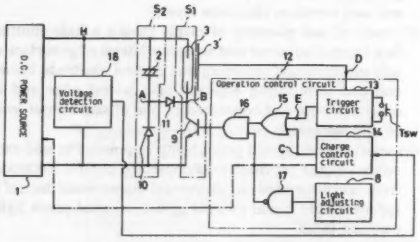
U.S. Cl. 315—241 P **7 Claims**

1. A strobe apparatus comprising:

a DC power source;

a first series connection of a strobe tube and a semiconductor switching device, said semiconductor switching device having a control electrode and being controlled by a controlling potential on the control electrode only, said first series connection being connected across said DC power source;

a second series connection of a main capacitor and a first diode of reverse direction with regards to charging of said main capacitor, said second series connection being connected across said DC power source;



a second diode of forward direction with regard to charging of said main capacitor, connected between a first junction point between said main capacitor and said first diode and a second junction point between said strobe tube and said switching device; and

an operation control circuit for controlling timings to turn on and off said switching device and a timing to excite said strobe tube, whereby said main capacitor is charged and discharged by turning on and off said switching device.

5,004,959

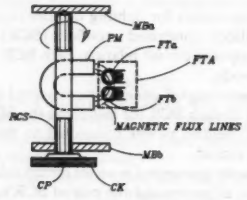
FLUORESCENT LAMP BALLAST WITH ADJUSTABLE LAMP CURRENT

Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010

Continuation of Ser. No. 853,872, Apr. 21, 1986, abandoned. This application Mar. 26, 1990, Ser. No. 498,498

Int. Cl.[5] H05B *41/29, 41/38*

U.S. Cl. 315—291 **20 Claims**



1. In a ballast for a gas discharge lamp, the ballast being adapted by way of a source of AC voltage to provide lamp operating current to the gas discharge lamp, the improvement comprising:

lamp current control means: (i) connected with the source of AC voltage, (ii) receptive of magnetic flux, and (iii) operative in response to this magnetic flux to control of the frequency of the AC voltage;

current-limiting means connected with the AC voltage and operative to provide the lamp operating current, the magnitude of the lamp operating current being dependent on the frequency of the AC voltage; and

magnetic flux means magnetically coupled with the charging control means and adapted to provide controllable magnetic flux to this control means, thereby to permit control of the frequency of the AC voltage and thereby the magnitude of the lamp operating current; the lamp operating current being defined as the current that is actually flowing through the gas discharge lamp.

5,004,960

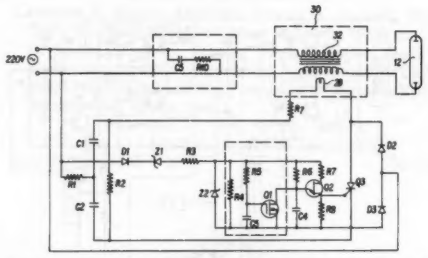
IGNITION DEVICE FOR A GAS DISCHARGE LAMP

David J. Cockram, and Edgar S. R. Cockram, both of Johannesburg, South Africa, assignors to Actronic Lighting CC, Edenvale, South Africa

Continuation-in-part of Ser. No. 181,496, Apr. 13, 1988, abandoned. This application Dec. 28, 1989, Ser. No. 458,086

Int. Cl.[5] H05B *41/36*

U.S. Cl. 315—307 **8 Claims**



1. An ignition device for a gas discharge which is driven by a source of electrical current having a periodic waveform, the device comprising a voltage multiplier which is adapted to be connected to the source and to provide an output having a higher voltage than that of the source; a pulse generator adapted to be driven by the output and to produce trigger pulses; sensing means for sensing the voltage of the source and for enabling the pulse generator when the voltage of the source exceeds a predetermined level, wherein the sensing means comprises a voltage dependent semiconductor device; timing means associated with the sensing means and the pulse generator and adapted to synchronize the enabling of the pulse generator with the occurrence of the peak in the waveform of the electrical source; and a resonant network having a primary winding to which the trigger pulses from the pulse generator are applied and a secondary winding which is in circuit with the lamp and which applies high-voltage ignition pulses to the lamp when the trigger pulses are applied to the primary winding, the ignition device thereby providing ignition pulses to the lamp automatically whenever the voltage of the source increases beyond the predetermined level, the ignition pulses being synchronized with peaks in the waveform of the electrical source.

5,004,961

WINDOW OPERATOR CONTROL

John M. Berner, Golden Valley, and Thomas A. Roman, St. Anthony, both of Minn., assignors to Truth Incorporated, Owatonna, Minn.

Division of Ser. No. 285,661, Dec. 16, 1988, Pat. No. 4,933,613. This application Apr. 19, 1990, Ser. No. 511,193

Int. Cl.[5] H02P *1/58*

U.S. Cl. 318—65 **6 Claims**

1. A control for operating a window operator having an electrically controlled drive for moving a window in preselected incremental movements between fully open and closed positions, comprising:

means for receiving a command to selectively move the window in a direction to the open position or the closed position;

means for determining when the drive has moved the window a preselected incremental distance, less than a distance between fully open and closed positions;

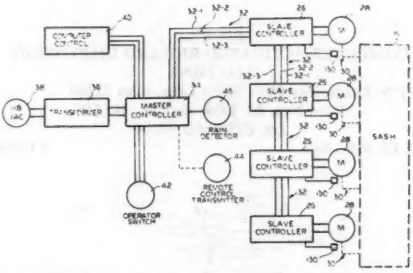
control means coupled to said receiving means and said determining means for enabling energization of the electrically controlled drive when a command is received by said receiving means until the drive has moved the window said preselected incremental distance and thereafter inhibiting energization of the drive until another com-

mand is received to move the window a subsequent incremental distance in the selected direction.

6. A window operator power control circuit for operating a window operator having a motor drive for moving a window between open and closed positions, comprising:

means for receiving bipolar electrical power to power the motor drive to selectively move the window in a direction to the open or closed position;

first and second transistors coupled between said receiving means and the motor drive;



means coupled to said receiving means and said transistors for driving said transistors if power is received by said receiving means;

a limit switch for sensing a desired movement of the window; and

means coupling said limit switch and said driving means for disabling said driving means to drive said transistors to uncouple the receiving means for the motor drive when said desired movement is sensed by said switch means.

5,004,962

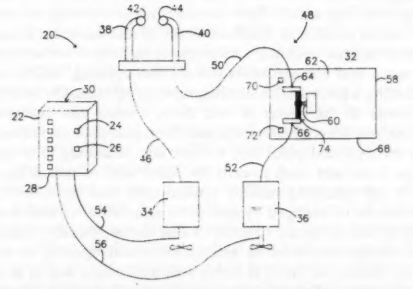
AUTOMATIC MOTOR SYNCHRONIZER

Jack G. Fonss, San Jose; Howard Z. Silverberg, Los Gatos, and Martin H. Gardiner, Sunnyvale, all of Calif., assignors to Arrow Marine, Inc., Santa Clara, Calif.

Filed Dec. 28, 1989, Ser. No. 458,085

Int. Cl.[5] B63H *25/02*

U.S. Cl. 318—85 **21 Claims**



1. An automatic motor synchronizer adapted for synchronizing (1) a slave motor operably coupled to a slave throttle lever through a slave cable, and (2) a master motor operably coupled to a master throttle lever through a master cable, comprising:

first means in direct line with the slave cable for causing said cable to substantially simultaneously adjust the slave motor speed and the position of the slave throttle lever and for continuously maintaining the slave motor directly coupled to the slave throttle lever;

second means for determining the difference in speed between the master motor and the slave motor;

third means for driving the first means responsive to the second means.

5,004,963

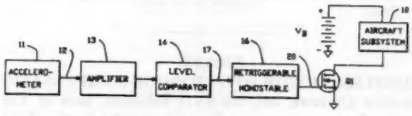
ACCELEROMETER BASED POWER CONTROL APPARATUS FOR AIRCRAFT SUBSYSTEM

Wayne R. Hay, Pleasant Hill, Calif., assignor to Systron Donner Corporation, Concord, Calif.

Filed Mar. 13, 1990, Ser. No. 493,136

Int. Cl.[5] H02J *7/00*; H01H *35/14*

U.S. Cl. 320—13 **4 Claims**



1. Power control apparatus for an aircraft subsystem comprising:

self-contained and independent electrical battery means carried by said aircraft, said aircraft subsystem being powered exclusively by said battery means;

switching means responsive to vibration or acceleration of said aircraft for electrically connecting said battery means to said aircraft subsystem to power said subsystem, whereby said battery means powers said subsystem only during flight of said aircraft to prolong battery life.

5,004,964

CONTROL APPARATUS FOR VIBRATION DRIVEN MOTOR

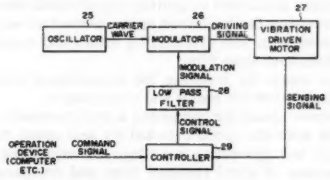
Kenichi Katsoka, Yokohama, and Takayuki Tsukimoto, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1990, Ser. No. 539,344

Claims priority, application Japan, Jun. 19, 1989, 1-156557

Int. Cl.[5] H02N *2/00*

U.S. Cl. 318—128 **15 Claims**



1. A vibration driven motor comprising:

(a) a vibration member;

(b) an electro-mechanical energy conversion element connected to said vibration member and responsive to an applied driving signal for reproducing a vibration in said vibration in said variation member, thereby to cause relative movement between said vibration member and a frictional member in contact with said vibration member;

(c) a modulating member functionally connected to said element for applying to said element said driving signal having a frequency for generating an nth-order (where n is an integer) vibration in said vibration member;

(d) a detecting member for generating a detecting signal corresponding to a vibrating state of said vibration member;

(e) a comparator for receiving said detecting signal and a reference signal and producing a signal corresponding to a difference between said detecting signal and said reference signal; and

(f) a filter connected to said modulating member for filtering frequencies of not more than a smaller value of $|n-(n-1)|$ and $|(n+1)-n|$ (where n is a frequency of said driving signal for generating the nth-order vibration in said vibration member, $(n+1)$ is a frequency of said driving signal for generating the $(n+1)$th-order vibration in said vibration member, and $(n-1)$ is a frequency of said driving signal for generating the $(n-1)$th-order vibration in said vibration member) represented by difference signals from said comparator, and for causing said modulating member to receive an electrical signal corresponding to the filtered frequencies,

wherein said driving signal is modulated by said modulating member in accordance with the electrical signal from said filter.

5,004,965

BRUSHLESS MOTOR WITH TORQUE COMPENSATION

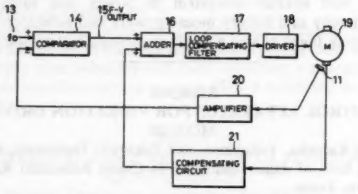
Mitsuhiro Otokawa, and Hiroyuki Takimoto, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 18, 1988, Ser. No. 195,647

Claims priority, application Japan, May 20, 1987, 62-121150; May 20, 1987, 62-121151; May 20, 1987, 62-121153

Int. Cl.[5] H02P *6/02*

U.S. Cl. 318—254 **3 Claims**



1. In a brushless motor which includes a rotor, comprising:

speed detecting means for detecting the rotating speed of said rotor;

synthesizing means or synthesizing the output wave forms of inverse electromotive forces of different phases of the brushless motor and outputting a synthesized wave form;

detector means for demodulating the synthesized wave form obtained from said synthesizing means and outputting a demodulated wave form;

inverter means for inverting the demodulated wave form from said detector means and outputting it;

comparator means for comparing a predetermined rotation speed with the speed detected by said speed detecting means and generating a voltage corresponding to the difference of speed obtained from said comparison and outputting it;

adding means for adding the output from said inverter means to the output from said comparator means and outputting it; and

drive control means for controlling the current supplied to said motor according to the output from said adding means.

3. In a brushless motor comprising:

speed detecting means for non-linearly detecting a speed of a rotor, said speed detecting means including a speed detecting magnet having magnetic poles for a frequency generator and provided on a periphery of said rotor, and a magnetic resistance device for detecting magnetic fields of said magnetic poles, said magnetic poles being spaced from each other in accordance with a pattern of torque ripple, denser at the position of higher torque and coarse at the position of lower torque;

comparator means for comparing a predetermined rotating speed with the speed detected by said speed detecting means and converting the difference between said speeds obtained by the comparison into a voltage value corresponding to the difference between said speeds, and outputting the voltage value; and

drive control means for controlling current supplied to the motor on the basis of the voltage value from said comparator means.

5,004,966

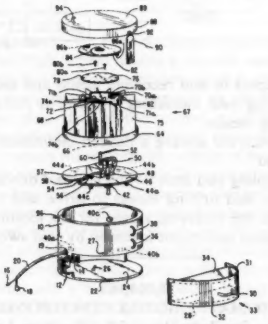
COMPUTER ACTIVATED REWARD DISPENSING MACHINE

Gary N. Eakin, Box 9039, Spirit Lake, Iowa 51360

Filed Nov. 29, 1989, Ser. No. 442,569

Int. Cl.[5] B65D *83/04*

U.S. Cl. 318—446 **4 Claims**



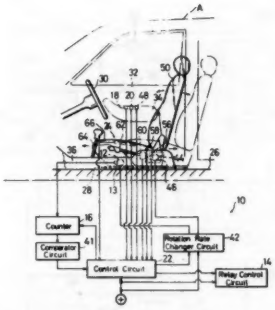
1. A computer activated reward dispensing machine comprising a carousel-type magazine having a hollow inner drum at its center, a plurality of slats radiating out from the outer wall of said inner drum thus forming a plurality of compartments spaced axially around said inner drum, said magazine resting on a middle floor, a case enclosing said floor and said magazine, said middle floor formed with an opening, an electric motor secured to said floor inside of said inner drum, gear reduction type coupling means driven by said motor adapted to move said compartments toward said opening, said motor including a drive shaft extending upward substantially perpendicularly to the center of said floor, a pivot bar extending across said drum remote from said floor, said shaft also extending through said pivot bar, a drive arm extending at a right angle from said shaft toward the inner wall of said drum, a drive tab extending radially inward from said inner wall in position to be engaged by said drive arm, whereby said drum will be driven by the rotation of said motor, thereby causing said compartments to be rotated over said opening in said floor, an electric valve in series with said motor and in series with a source of electric power, said valve thus being effective to allow or prohibit the flow of power to said motor, said valve being responsive to signals from a computer programmed to send such a signal to said valve, an electric switch in series between said motor and said source of power but in parallel with said electric valve, and alignment means connected to said switch adapted to sense alignment between said compartment and said opening in said floor and to control the power flow from said source through said switch to operate said motor until such alignment is reached and to stop operation of said motor at that time.

5,004,967

METHOD AND DEVICE FOR CONTROLLING SLIDE MOTION OF A VEHICLE SEAT

Hiromitsu Ogasawara, Akishima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1990, Ser. No. 495,358
Int. Cl.[5] G05B *19/42*
U.S. Cl. 318—568.1 9 Claims



1. A method for controlling a slide motion of a vehicle seat, in which said seat is slidingly moved between a seating position and backward position by a drive of a motor through a operation of a switch means, said seating position being able to be preset according to a seating taste of an occupant who sits on the seat and said backward position being defined where said seat is to be moved backwardly and stopped at a point away from a front of the vehicle to permit said occupant to climb onto or descend from said seat without hindrance of projected parts or fittings mounted in said vehicle, said method comprising the steps of:

detecting and memorizing a rotation number of said motor which is produced to cause said seat to move from a preset point of said seating position to said backward position; and

causing said motor to rotate by a number equal to said memorized rotation number, so as to automatically return said seat to said preset point of said seating position;

said step of detecting and memorizing said motor rotation number involving counting said rotation number by means of a counter being actuated in response to a rotation sensor provided on said motor, said rotation sensor being adapted to detect said rotation umber of said motor, wherein said method further includes the steps of:

providing a switch means having a first switch area for energizing said motor to rotate in a direction to cause said seat to move to said backward position and a second direction opposite to said first direction so as to return said seat to said seating position;

resetting said rotation number to zero in said counter when turning on said first switch area of said switch means, prior to said seat being caused by said motor to move to said backward position, in order that said counter starts to count up said rotation number from zero in response to said rotation sensor detecting rotation of said motor starting to rotate in said first direction;

causing said counter to memorize a total number of thus-counted-up rotations of said motor when said seat reaches said backward position; and

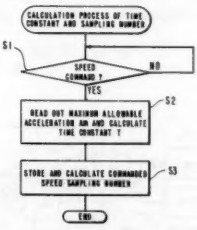
permitting return of said seat from said backward position to said seating position by turning on said second switch area of said switch means, in which case, said counter counts down said memorized total rotation number and said seat is returned to said seating position until said total rotation number is counted down to zero by said counter.

5,004,968

METHOD FOR ACCELERATION AND DECELERATION CONTROL OF SERVOMOTORS

Toru Mizuno, Tama, and Ryuichi Hara, Oshino, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP88/01241, § 371 Date Jul. 5, 1989, § 102(e) Date Jul. 5, 1989, PCT Pub. No. WO89/06066, PCT Pub. Date Jun. 29, 1989
PCT Filed Dec. 9, 1988, Ser. No. 381,396
Int. Cl.[5] H02P *5/00*
U.S. Cl. 318—615 11 Claims



1. A method for controlling acceleration and deceleration of at least one servomotor mounted to a machine, said method comprising the steps of:

(a) sampling, at a predetermined sampling period, a commanded speed for the servomotor;

(b) varying a time constant for acceleration/deceleration control by dividing the commanded speed sampled in step (a) by a predetermined maximum allowable acceleration/deceleration of the machine after the commanded speed is sampled in step (a); and

(c) controlling acceleration/deceleration of the at least one servomotor in accordance with the time constant varied in step (b) and the commanded speed sampled in step (a).

5,004,969

PHASE CONTROL SWITCHING CIRCUIT WITHOUT ZERO CROSSING DETECTION

David J. Schanin, Carlos, Calif., assignor to Bayview Technology Group, Inc., San Carlos, Calif.

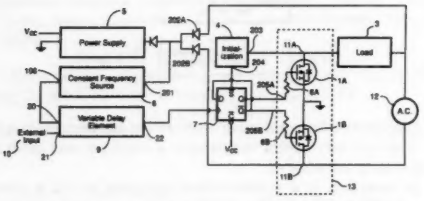
Filed Oct. 16, 1989, Ser. No. 422,396
Int. Cl.[5] G05F *1/445*
U.S. Cl. 323—235 14 Claims

1. A phase control power switching circuit for controlling the phase angle of current flow through a load from an alternating current source, said circuit comprising:

a pair of voltage controlled switches in inverse series connection between said load and said alternating current source for controlling the current flow through said load;

drive means for driving said voltage controlled switches in an inverse fashion to ensure that one switch is always in a conducting mode and that one switch is always in a non-conducting mode; and

toggle means for toggling said drive means so that each of said voltage controlled switches alternates between the



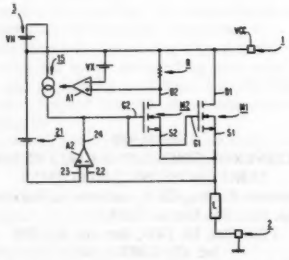
conducting mode and the non-conducting mode when the phase angle of current flow is determined to be proper.

5,004,970

DEVICE AND A PROCESS FOR DETECTING CURRENT FLOW IN A MOS TRANSISTOR

Michel Barou, Voreppe, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Jan. 19, 1990, Ser. No. 467,459
Claims priority, application France, Jan. 20, 1989, 89 01230
Int. Cl.[5] G05F *1/573*
U.S. Cl. 323—277 **5 Claims**



1. A device for detecting the flow of current lower than a given threshold current in a load, wherein the load is series connected through the source and drain terminals of a MOS transistor to a supply source, and the gate of the MOS transistor is connected to a control source, said device comprising:

means for detecting a voltage drop across the source and drain terminals of the MOS transistor; and

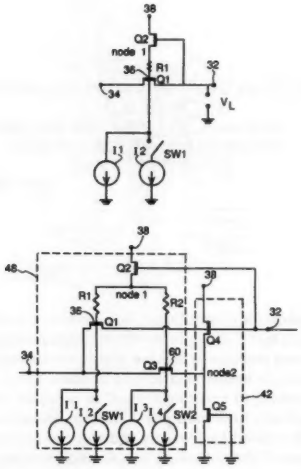
a control loop for imposing an appropriate gate voltage to the MOS transistor as soon as the voltage drop across said source and drain terminals tends to decrease below a predetermined level.

5,004,971

FLOATING TRANSISTOR SWITCH

Mark E. Fitzpatrick, San Jose, and Robert C. Burd, Sunnyvale, both of Calif., assignors to Gazelle Microcircuits, Inc., Santa Clara, Calif.

Filed Apr. 5, 1990, Ser. No. 505,858
Int. Cl.[5] G05F *1/46, 3/08*
U.S. Cl. 323—312 **15 Claims**



1. A switch comprising:

a first terminal;

a second terminal;

a first transistor having a first current handling terminal coupled to said first terminal and a second current handling terminal coupled to said second terminal, said first transistor having a current control terminal; and

a first biasing means having an output terminal coupled to said current control terminal of said first transistor, said first biasing means having a control terminal coupled to said first terminal,

said first biasing means being configured to generate a first voltage at said output terminal which creates a first predetermined voltage differential between said current control terminal of said first transistor and said first current handling terminal of said first transistor for turning on said first transistor despite variations in voltage at said first terminal,

said first biasing means also being configured to generate a second voltage at said output terminal required to turn off said first transistor.

5,004,972

INTEGRATED POWER LEVEL CONTROL AND ON/OFF FUNCTION CIRCUIT

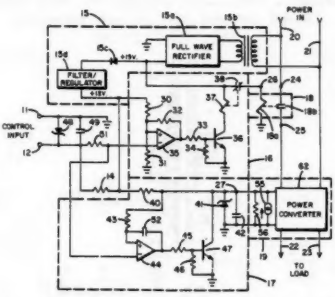
Roger R. Roth, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 26, 1989, Ser. No. 457,221
Int. Cl.[5] G05F *5/02;* G05B *24/02*
U.S. Cl. 323—320 **3 Claims**

1. In an electric power control system including a load power control circuit for varying the level of power supplied to a load by a power source according to the value of a variable impedance connected across control terminals of said load power control circuit, said load power control circuit of the type providing at its control terminals an output voltage varying in response to the value of the impedance across the control

terminals, an improvement for switching the power from the load responsive to a preselected voltage across the control terminals, and comprising

(a) a voltage sensor receiving the voltage across the load power control circuit control terminals and providing an output signal having a first preselected voltage responsive to the load power control circuit control terminals voltage falling within a preselected range, and a second preselected voltage otherwise; and



(b) a switch means having a pair of power terminals for series connection with the load power control circuit, the power source, and the load and having a control terminal receiving the voltage sensor's output signal and responsive to the first preselected voltage, for forming an electrical connection between the pair of power terminals, and responsive to the second preselected voltage, for opening the electrical connection between the pair of power terminals.

5,004,973

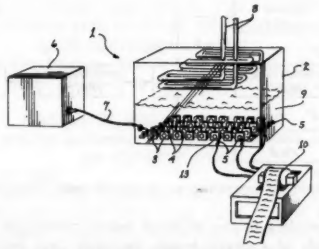
METHOD AND APPARATUS FOR MAINTAINING ELECTRICALLY OPERATING DEVICE TEMPERATURES

Richard Taraci; Brian Taraci, both of Phoenix, and Imre Gorgenyi, Scottsdale, all of Ariz., assignors to Thermal Management, Inc., Tempe, Ariz.

Filed Jul. 13, 1989, Ser. No. 379,083

Int. Cl.[5] G01R *31/02;* **H01L** *23/44*

U.S. Cl. 324—158 R **20 Claims**



1. A method for maintaining an electrically operating device at a desired temperature during operation of the device, comprising the steps of:

a. installing the device in a bath of a first inert liquid having a boiling point less than the desired device temperature;

b. electrically operating the device, thereby generating heat which is transferred to the bath by nucleate boiling of the liquid;

c. monitoring the device temperature until it stabilizes at a temperature near the boiling point of the first inert liquid and below a desired device temperature; and

d. adding, incrementally, to the bath a second inert liquid having a boiling point greater than the desired device temperature to modify the rate of nucleate boiling of the first inert liquid while simultaneously monitoring the device temperature until it reaches the desired device temperature.

5,004,974

ELECTRIC CURRENT SENSING DEVICE

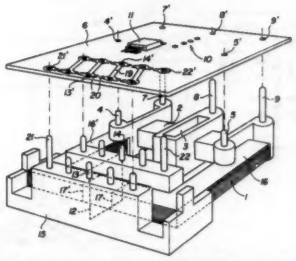
Pierr Cattaneo, Saint-Julien, and Claude Gudel, Entrembières, both of France, assignors to Liasons Electroniques-Mecaniques, Switzerland

Filed Sep. 11, 1989, Ser. No. 405,554

Claims priority, application Switzerland, May 30, 1989, 2031/89

Int. Cl.[5] G01R *1/20*

U.S. Cl. 324—117 R **7 Claims**



1. An electric sensing device for measuring a current flowing in at least one primary conductor and/or for producing a representation of this current, the device including at least one magnetic circuit, coupled with the said primary conductor, and a device for detecting or measuring the magnetic flux in the said circuit, said primary conductor comprising several substantially U-shaped conductor portions, said portions being arranged to each partially surround a section of the said magnetic circuit and being arranged for connection to a connecting device, said connecting device being selected among several connecting devices having each conductor element arranged for connecting certain of the said conductor portion together so as to form with the said conductor portions at least one primary winding having a respective chosen number of turns.

5,004,975

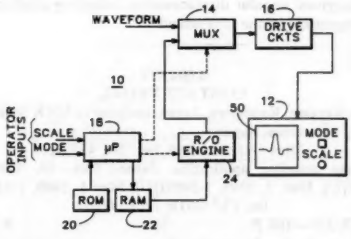
ADJUSTABLE ELECTRONIC GRATICULES FOR MEASURING WAVEFORM DISTORTIONS

Dale A. Jordan, Hillsboro, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 28, 1990, Ser. No. 546,270

Int. Cl.[5] G01R *31/22, 13/30*

U.S. Cl. 324—121 R **2 Claims**



1. An apparatus for measuring distortions of a waveform using adjustable electronic graticules comprising:

means for generating a display list based upon operator

inputs of measurement mode and scale factor that represents a graticule and a measurement value;

means for generating from the display list electronic signals for the graticule and the measurement value; and

means for displaying the graticule and the measurement value together with the waveform.

5,004,976

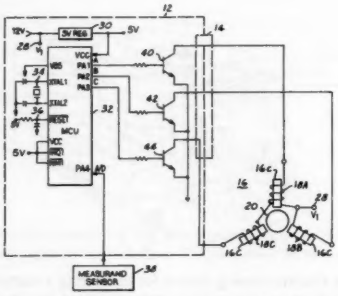
WYE WINDING RADIAL AIR-CORE GAUGE SYSTEM

Paul A. Markow, Huntsville; William Nolle, Hazel Green, and Charles L. Bell, Huntsville, all of Ala., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Nov. 3, 1989, Ser. No. 431,129

Int. Cl.[5] G01R *1/00*

U.S. Cl. 324—154 R **7 Claims**



1. A wye winding type air-core gauge system for generating a movable electromagnetic field in a direction and of a field strength proportional to a magnitude and a direction of input electrical signals representing changes in magnitude of a measurand emanating from a measurand source, said system comprising:

(a) wye-coil, radial air-core gauge means for providing a visual angular displacement indicative of changes in magnitude of the measurand;

(b) sensor means having an input terminal connected to said measurand source for sensing the changes in magnitude of the measurand and to produce therefrom a series of electrical signals in a chosen format representing changes in magnitude of the measurand; and

(c) control means adapted to receive said series of electrical signals and to produce therefrom combinations of maximum amounts of a voltage signal to a chosen coil of said gauge means and a series of pulse width modulated (PWM) signals at a chosen frequency and of durations to a selected second or third coil of said gauge in response to changes of magnitude of said series of magnitude signals for generating control signals to the chosen and selected coils of said gauge means which cause the occurrences of the visual angular displacements indicative of changes in magnitude of the measurand.

5,004,977

CONTACT PROBE

Toshio Kazama, Kanagawa, Japan, assignor to NHK Spring Co., Ltd., Yokohama, Japan

Filed Oct. 20, 1989, Ser. No. 424,511

Claims priority, application Japan, Oct. 24, 1988, 63-138376[U]; Mar. 3, 1989, 1-24651[U], May 1, 1989, 1-112691

Int. Cl.[5] G01R *1/06, 31/02*

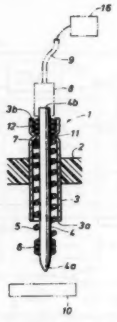
U.S. Cl. 324—158 P **5 Claims**

1. A contact probe, comprising:

an elongated electroconductive needle member having a forward end, said needle member having a smooth, uninterrupted exterior surface;

a tubular holder having an open end, said tubular holder slidably receiving said needle member;

a compression coil spring coiled around said needle member whereby said needle member can slide within said coil spring, said coil spring having a first portion thereof engaged with said tubular holder and a second portion thereof secured to said needle member to thereby urge the



forward end of said needle member to project from said open end of said tubular member;

stopper means secured to said needle for restricting the extent to which said forward end of said needle member projects from said open end of said tubular holder; and

lead means for electrically connecting said needle member to an external circuit.

5,004,978

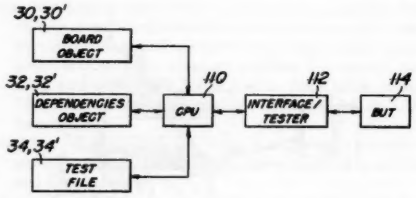
METHOD FOR REGENERATING IN-CIRCUIT TEST SEQUENCES FOR CIRCUIT BOARD COMPONENTS

Carrell E. Morris, Jr., Fort Collins; Robert E. Balliew, Loveland; Mark A. Mathieu, Loveland, and Darrell B. Johnsrud, Loveland, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 29, 1990, Ser. No. 501,991

Int. Cl.[5] G01R *31/28*

U.S. Cl. 324—158 R **15 Claims**



1. Method of operating an in-circuit-tester comprising the steps of:

(a) providing in the in-circuit tester information defining details of a circuit board, including data indicative of devices to be tested on the board;

(b) generating, according to at least the information provided in step (a), test sequences for the devices to be tested on the board;

(c) automatically determining, for each device for which a test sequence was generated in step (b), whether other devices on the board affect the test sequence for the device to be tested and identifying the other devices; and,

(d) storing data indicative of the results of step (c) in a memory associated with the in-circuit tester;

the in-circuit tester thereby having stored in the memory, data indicative of the other devices that should be consid-

ered in deciding whether to generate new test sequence(s) for each device.

5,004,979

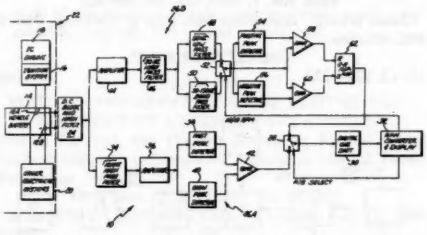
BATTERY TACH

Joseph A. Marino, Waukesha; Surender K. Makhija, Brookfield; Majid Taghikhani, Milwaukee, and Peter A. Puetz, Waukesha, all of Wis., assignors to Bear Automotive Service Equipment Company, New Berlin, Wis.

Continuation of Ser. No. 116,634, Nov. 3, 1987, abandoned. This application Mar. 16, 1990, Ser. No. 496,103

Int. Cl.[5] G01P *3/42*

U.S. Cl. 324—160 29 Claims



1. A circuit for providing an output signal representative of speed of an internal combustion engine of the type having an electrical ignition system connected to a battery, the circuit comprising:

means for deriving directly from the battery an input signal representative of time-varying components in battery current, where battery current is the current flow appearing at a battery terminal;

means for filtering the input signal to produce a filtered signal comprising time-varying components of the input signal having frequencies within a range of frequencies associated with a time-varying signal impressed upon the battery current by operation of the ignition system; and

means for suppressing components in the filtered signal not associated with ignition system operation to produce the output signal as a function of engine speed.

5,004,980

WHEEL BEARING APPARATUS PROVIDED WITH COMPACT WHEEL ROTATION SPEED DETECTOR LYING WITHIN THE OUTSIDE PERIPHERY OF THE BEARING APPARATUS

Tomoyasu Ida; Makoto Nohara, and Nobuyuki Seo, all of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Sep. 27, 1989, Ser. No. 413,387

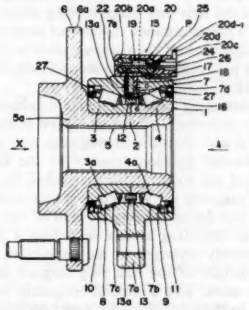
Claims priority, application Japan, Jun. 2, 1989, 1-141778

Int. Cl.[5] G01P *3/48*

U.S. Cl. 324—166 9 Claims

1. A wheel bearing apparatus which comprises: an inside member having a main body lying along an axis, a flange projecting radially outwardly on one end of said main body for mounting the wheel bearing apparatus on a wheel, said flange having a radially outer edge, and a detected member which has multiple projections placed at regular intervals around the circumference of the main body; an outside member which is placed on the same axis as the inside member and adapted to be fixed to a chassis; multiple rolling elements which are placed between raceway surfaces of the inside member and raceway surfaces of the outside member so as to roll in the circumferential direction on the raceway surfaces; and a wheel rotation speed detector which is mounted on the outside member and which includes a detector end portion having a sensor in spaced opposed relation to the detected member of the inside member, and a circuit housing which is connected to the detector end portion and contains a circuit for processing a signal input from the sensor, so that the rotation of the inside member is detected by the wheel rotational speed detector;

said wheel rotation speed detector having a simplified L-shape, and the detector end portion being embedded in the outside member and extending substantially in the radial direction of the outside member so as to be in spaced opposed relation to the detected member, and the circuit housing is provided on the outside surface of the outside member in parallel with the axial direction of the outside member being inside, in the radial direction, the radially outer edge of the flange;



said outside member having at least one flange projecting in the radial direction of the outside member and having radially outer edges, and a surface portion on the outside surface of the outside member positioned radially inwardly of said radially outer edges of said flanges and extending in parallel with the axial direction of the outside member, said circuit housing of said rotational speed detector being mounted on said surface portion and lying inside, in the radial direction, of said radially outer edges of said flanges and having a connector portion at an end of the circuit housing, said connector portion having an opening which faces neither the flange of said outside member nor the flange of said inside member.

5,004,981

DETECTOR DEVICE FOR SIMULTANEOUSLY DETECTING BOTH THE DIRECTION AND NUMBER OF ROTATIONS OF ROTATING MEMBER

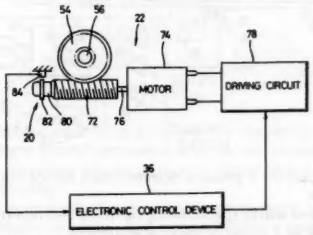
Toru Hashimoto; Masato Takabatake; Masashi Chino, and Akira Takahashi, all of Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1989, Ser. No. 434,082

Claims priority, application Japan, Nov. 18, 1988, 63-290242; Nov. 18, 1988, 63-290243; Oct. 27, 1989, 1-278348

Int. Cl.[5] G01B *7/30;* G01P *3/487;* G05D *13/00;* F02D *9/00*

U.S. Cl. 324—207.22 22 Claims



14. A sensor for detecting direction and number of revolu-

tions of a rotating member which is rotated in forward and reverse directions, comprising:

a magnetic assembly arranged around an outer peripheral surface of the rotating member, the magnet assembly including first and second ring magnets of identical shape, securely arranged and surrounding the outer peripheral surface of the rotating member and spaced apart from each other at a predetermined distance in an axial direction of the rotating member, the first and second ring magnets each having a north pole region magnetized to be a north magnetic pole and extending over one circumferential portion of an outer peripheral surface thereof and a south pole region magnetized to be a south magnetic pole and extending over another circumferential portion of the other peripheral surface thereof, the north and south pole regions of the first ring magnet being shifted in rotational phase by a predetermined number of degrees in a circumferential direction of the rotating member from the north and south pole regions of the second ring magnet, respectively; and

magnetism detecting means for detecting changes in polarity caused by movement of the north and south pole regions of the first and second ring magnets, at a predetermined circumferential position relative to the circumferential direction of the rotating member when the first and second ring magnets are rotated together with the rotating member, and for outputting a result of the detection, the magnetism detecting means including a first magnetic probe securely arranged in the vicinity of the outer peripheral surface of the first ring magnet and always opposed to same, and a second magnetic probe securely arranged in the vicinity of the outer peripheral surface of the second ring magnet and always opposed to same, the first magnetic probe outputting a binary signal of a different level depending on whether it is opposed to the north or south pole region of the first ring magnet, the second magnetic probe being located at the same circumferential position as the first magnetic probe with respect to the circumferential direction of the rotating member, and outputting a binary siganl of a different level depending on whether it is opposed to the north or south region of the second ring magnet.

5,004,982

SCALES FOR POSITION DETERMINING APPARATUS HAVING MARKS OF DIFFERENT AMPLITUDES THEREON

Raymond J. Chaney, Berkeley; David R. McMurtry, Wotton-Under-Edge, and David Wilson, Stonehouse, all of United Kingdom, assignors to RIENSHAW plc, Gloucestershire, United Kingdom

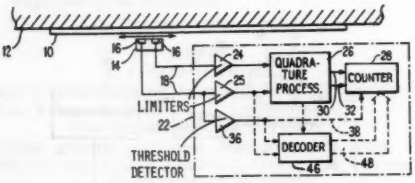
Continuation of Ser. No. 264,965, filed as PCT GB88/00119 on Feb. 24, 1988, published as WO88/06717 on Sept. 7, 1988, abandoned.

This application Jul. 23, 1990, Ser. No. 555,792

Claims priority, application United Kingdom, Feb. 24, 1987, 8704204; Mar. 6, 1987, 8705304; Mar. 21, 1987, 8706789

Int. Cl.[5] G01B *7/14*

U.S. Cl. 324—207.22 **8 Claims**



1. A scale for a position determination device comprising:

a track,

a series of marks spaced along the track and recorded on the track as a signal of varying amplitude,

said marks comprising first marks having a first amplitude with coding groups of marks interspersed therewith, each coding group including a plurality of second marks having a second amplitude which is distinguishable from the first amplitude,

the marks within a said group being arranged in a code to provide information relating to the positions of selected ones of the first marks.

5,004,983

CIRCUIT ARRANGEMENT FOR GENERATING RF SIGNALS FOR MR EXAMINATIONS

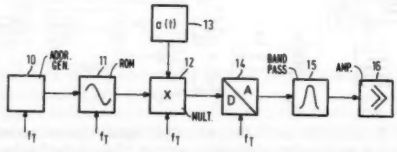
Roland Proksa; Peter Roschmann, both of Hamburg, Fed. Rep. of Germany, and Noel J. M. van den Berg, Zoetermeer, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 1, 1989, Ser. No. 359,620

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1988, 3821984

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—322 **20 Claims**



1. A circuit arrangement for generating rf signals at a Larmor frequency "f_L" for transmission into an examination zone during MR examinations, comprising a read-only memory in which samples of a sinusoidal waveform are stored in the form of a series of data words, an address generator means for reading data words from the read-only memory with a clock frequency "f_T" such that cycles of the sinusoidal waveform are read out from said read-only memory with a frequency "f_S", there being at least two data words read from the read-only memory for each cycle of the sinusoidal waveform, and a digital-to-analog converter which succeeds the read-only memory, wherein "f_T" and "f_S" are chosen such that a frequency spectrum at the output of the digital-to-analog converter comprises a spectral line at the Larmor frequency f_L, and wherein $f_L > f_S$.

5,004,984

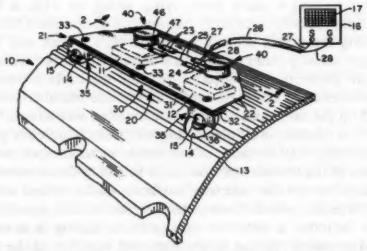
MAGNETIC FIELD PICKUP ASSEMBLY FOR DIAGNOSITICS ON SPECIFIC ENGINE

Thomas P. Becker, Kenosha, Wis.; Sohrab S. Rameshk, Libertyville, Ill., and Matthew M. Crass, Kenosha, Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.

Filed Sep. 8, 1989, Ser. No. 404,430

Int. Cl.[5] F02P *17/00*

U.S. Cl. 324—402 **10 Claims**



1. An inductive pickup assembly for sensing the electromag-

netic fields of ignition coils of an automotive engine having a plurality of such ignition coils, direct access to which ignition coils is prevented by associated engine housing structure mounted by fastening means, said pickup assembly comprising:

a frame disposable on the housing structure in a predetermined configuration, said frame having a plurality of locating members adapted for cooperation with fastening means accurately to position said frame in said predetermined configuration, and a plurality of inductive coil sensing means equal in number to the ignition coils and carried by said frame in predetermined positions such that when said frame is disposed in its predetermined configuration on the housing structure said sensing means are respectively properly positioned for sensing the electromagnetic fields of the ignition coils, each of said sensing means including a helical sensing coil of electrically conductive wire having an axis extending between opposite ends of the sensing coil, and a magnetizable metal shield covering only one end of said sensing coil.

5,004,985

METHOD AND APPARATUS FOR TESTING THE RESPONSE OF A STRESS WAVE SENSOR

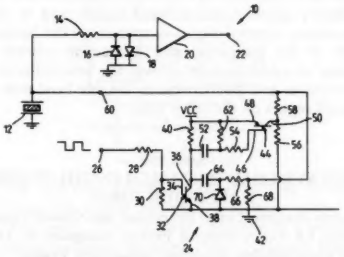
Trevor J. Holroyd, and Timothy E. Tracey, both of Derby, England, assignors to Stresswave Technology Limited, Derby, England

Filed Mar. 15, 1990, Ser. No. 493,708

Claims priority, application United Kingdom, Apr. 21, 1989, 8909155

Int. Cl.[5] G01R *29/22*

U.S. Cl. 324—727 **14 Claims**



1. A method of testing the response of a stress wave sensor, the stress wave sensor comprising a transducer and an amplifier arranged electrically in series,

the method comprising supplying to the sensor at a point electrically between the transducer and the amplifier at least one first electrical pulse having a relatively large amplitude such that it causes an operative transducer to oscillate, an operative transducer caused to oscillate by the at least one electrical pulse generating an additional electrical pulse,

supplying the first electrical pulse and any additional electrical pulse generated by the transducer to the amplifier, an operative amplifier amplifying the first electrical pulse and any additional electrical pulse to produce an output signal,

determining from the output signal of the amplifier if any one or more of the transducer and amplifier are not operating satisfactorily, an inoperative amplifier not amplifying the first electrical pulse and any additional electrical pulse and not producing an output signal, the lack of an output signal from the amplifier indicating that the amplifier is inoperative,

supplying to the sensor at the point electrically between the transducer and the amplifier a second electrical pulse having a relatively small predetermined amplitude such that it does not saturate the amplifier,

supplying the second electrical pulse to the amplifier,

and determining from the output signal of the amplifier corresponding to the second electrical pulse the gain of the amplifier.

5,004,986

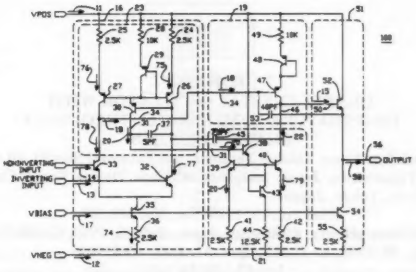
OP-AMP WITH INTERNALLY GENERATED BIAS AND PRECISION VOLTAGE REFERENCE USING SAME

Mark W. Bohrer, Saratoga, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 2, 1989, Ser. No. 415,896

Int. Cl.[5] H03F *3/45*

U.S. Cl. 330—257 **24 Claims**



13. A method of converting a first and a second input signal into an output signal, comprising the steps of:

accepting said first and second input signals;

generating an intermediate signal as a function of said first and second input signals;

establishing a stable reference whose stability is independent of fluctuations of said input signals;

generating a control signal according to said stable reference and independently of fluctuations of said input signals;

producing a current signal according to said control signal and independently of fluctuations of said input signals; and

converting said intermediate signal to said output signal according to said current signal.

5,004,987

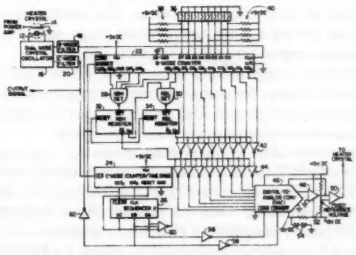
TEMPERATURE COMPENSATED CRYSTAL RESONATOR FOUND IN A DUAL-MODE OSCILLATOR

Leslie C. Hurley, Carlisle, Pa., assignor to Piezo Crystal Company, Carlisle, Pa.

Filed May 19, 1989, Ser. No. 363,595

Int. Cl.[5] H03B *5/32*; H03L *1/02*; G05D *23/20*

U.S. Cl. 331—70 **18 Claims**



1. A circuit for controlling an output of a dual-mode oscillator including a crystal resonator, wherein the output of the dual-mode oscillator comprises a first signal and a second signal, comprising:

first counting means for counting in accordance with the first signal to produce a first output defining a time period;

second counting means for counting in accordance with the

second signal for the time period defined by the first output to produce a second output defining a temperature of the crystal resonator; and

processing means for processing the second output to derive a temperature control signal for selectively adjusting the temperature of the crystal resonator.

5,004,988

QUARTZ CRYSTAL OSCILLATOR WITH TEMPERATURE-COMPENSATED FREQUENCY CHARACTERISTICS

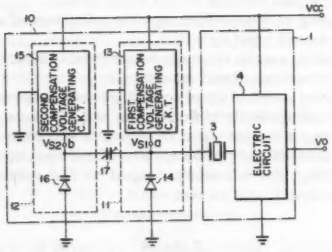
Yoshifusa Ueno; Takihei Tanzawa, and Takayuki Suzuki, all of Tokorozawa, Japan, assignors to Nihon Dempa Kogyo Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1989, Ser. No. 382,107

Claims priority, application Japan, Jul. 25, 1988, 63-186276; Sep. 30, 1988, 63-248632; Dec. 31, 1988, 63-335049

Int. Cl.[5] H03B *5/04*

U.S. Cl. 331—116 R **12 Claims**



1. A temperature-compensated crystal oscillator, for providing a signal oscillating at a predetermined frequency, said crystal oscillator having frequency-temperature characteristics depending upon temperature, the frequency of the signal provided by said oscillator being determined by said frequency-temperature characteristics, said oscillator comprising:

oscillating circuit means for providing an oscillating signal, said oscillating circuit means having a quartz crystal vibrator as an oscillating element, said oscillating circuit means having a rated temperature range and given frequency-temperature characteristics; and

temperature compensating means coupled to said quartz crystal vibrator for compensating the frequency-temperature characteristics of said oscillating circuit means, said temperature compensating means including:

first temperature compensating means for compensating the frequency-temperature characteristics of the oscillating circuit means within a rated temperature range of said oscillating circuit means to obtain compensated frequency-temperature characteristics; and

second temperature compensating means for further compensating said compensated frequency-temperature characteristics in a specific temperature region of said compensated frequency-temperature characteristics, said specific temperature region being within said rated temperature range and extending over only a part of said rated temperature range, to obtain desired frequency-temperature characteristics for the crystal oscillator.

5,004,989

OSCILLATOR FOR CONTROLLING A MIXER STAGE IN A TUNER

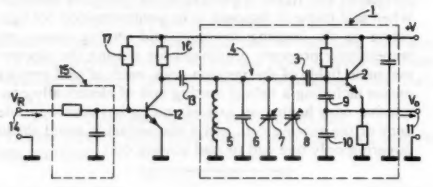
Rudolf Hasler, Vienna, Austria, assignor to U.S. Philips Corp., New York, N.Y.

Filed Dec. 13, 1989, Ser. No. 450,338

Claims priority, application Austria, Dec. 19, 1988, 3081/88

Int. Cl.[5] H03B *5/00*

U.S. Cl. 331—117 R **2 Claims**



1. An oscillator, for controlling a mixer stage in a tuner which oscillator comprises:

an active circuit element and a parallel resonant circuit including a variable capacitance which is variable in dependence upon a fine-tuning control signal, characterized in that;

the variable capacitance is comprised of a transistor separate from the active element whose collector is capacitively coupled to the parallel resonant circuit and whose base and emitter are connected to ground for alternating current, in that the operating point of the transistor is chosen to be such that both its base-emitter junction and its base-collector junction are forward biased, and in that the fine-tuning control signal is applied to the base-emitter path of the transistor, said fine-tuning control signal within its control range driving the base-collector junction further into conduction on the one hand and into its cut-off region on the other hand.

5,004,990

MICROWAVE LOAD IN SMALL-LENGTH OVERSIZED WAVEGUIDE FORM

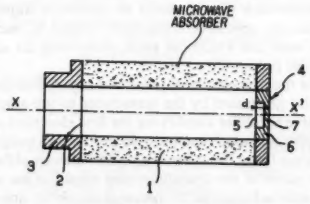
Jean-Pierre Bergero, Limeil Brevannes, and Claude Couasnard, Meudon La Foret, both of France, assignors to Thomson Tubes Electroniques, Boulogne Billancourt, France

Filed Nov. 13, 1989, Ser. No. 436,006

Claims priority, application France, Nov. 15, 1988, 88 14800

Int. Cl.[5] H01P *1/26*

U.S. Cl. 333—22 R **12 Claims**



1. A microwave load for attenuation of waves with low losses that are propagated in an oversized waveguide comprising:

a body of absorbent material having a longitudinal axis and an interior cross section substantially equal to or larger than an interior cross section of the oversized waveguide, the body forming a waveguide section and having a first open end connected to the oversized waveguide and a second open end; and

a mode reflecting and converting device closing the second

end of the body and having a part thereof which is oriented substantially transversely to the longitudinal axis, the part facing an interior of the body;

wherein the part comprises at least one offset portion forming one of a recess and projection defining at least two distinct reflecting planes for converting a mode of waves located at the second end of the body into at least one mode of higher losses and for reflecting converted waves towards the first end for absorption.

5,004,991

LOW PASS FILTER SYSTEM FOR AN ELECTRICAL CIRCUIT

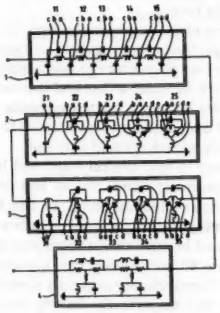
Béla Teleki, Newcastle under Lyme, United Kingdom; Alan G. Holden, Chesire, England, and Leang H. Chong, Penang, Malaysia, assignors to Johnson Matthey Public Limited Company, London, England

Filed Apr. 3, 1987, Ser. No. 33,969

Claims priority, application United Kingdom, Apr. 4, 1986, 8608298.

Int. Cl.[5] H03H *7/075*

U.S. Cl. 333—168 **7 Claims**



1. A low pass filter system for filtering from an electrical circuit unwanted signals having a frequency above a pre-selected frequency whilst allowing passage to a passband of signals whose frequency is below the pre-selected frequency, the system comprising:

a low pass filter having an input and a filtered output;

a first group delay means having an input connected to the filtered output of the filter and having an output, said first group delay means comprises a plurality of combinations of inductance and capacitance elements, each said combination being tuned to affect a particular frequency group of the passband of signals such that the cumulative effect of the combination is to impart a delay to at least 90% of said passband of signals passing through said first group delay means; and

at least one additional group delay means having an input connected to the output of the first group delay means and having an output, said additional group delay means comprising a plurality of combinations of inductance and capacitance elements, each said combination being tuned to affect a particular frequency group of the passband of signals such that the cumulative effect of the combinations is to impart delay to at least 90% of the passband of signals and the cumulative effect of the first and the additional group delay means together is to impart sufficient extra delay to said passband of signals at the output of the additional group delay means to bring the delay provided to at least 90% of the wanted signals to within 20 ns of the delay provided to the passband signal having a highest frequency.

5,004,992

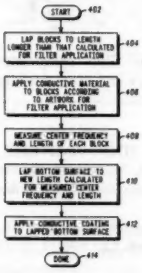
MULTI-RESONATOR CERAMIC FILTER AND METHOD FOR TUNING AND ADJUSTING THE RESONATORS THEREOF

Steven E. Grieco, and Douglas A. Morris, both of Albuquerque, N. Mex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 25, 1990, Ser. No. 529,098

Int. Cl.[5] H01P *1/202*

U.S. Cl. 333—202 **8 Claims**


START
402
LAP BLOCKS TO LENGTH LONGER THAN THAT CALCULATED FOR FILTER APPLICATION
404
APPLY CONDUCTIVE MATERIAL TO BLOCKS ACCORDING TO ARTWORK FOR FILTER APPLICATION
406
MEASURE CENTER FREQUENCY AND LENGTH OF EACH BLOCK
408
LAP BOTTOM SURFACE TO NEW LENGTH CALCULATED FOR MEASURED CENTER FREQUENCY AND LENGTH
410
APPLY CONDUCTIVE COATING TO LAPPED BOTTOM SURFACE
412
DONE
414

1. A method manufacturing a filter with a predetermined center frequency, said method comprising the steps of:

producing dielectric means comprised of a dielectric material having top, side and bottom surfaces, said dielectric means further having at least two holes extending from the top surface toward the bottom surface thereof and spatially disposed at a predetermined distance from one another, the side and bottom surfaces of said dielectric means selectively covered with a conductive material to provide a transmission line resonator for each of said at least two holes, and said at least two holes having a length that is greater than a predetermined length producing the predetermined center frequency, and said dielectric means having at least two measurable frequency related characteristics;

producing an artwork mask for adjusting the frequency related characteristics of the dielectric means;

applying conductive material to the top surface of said dielectric means in accordance with the artwork mask;

measuring one of the frequency related characteristic of said dielectric means to obtain a measurement;

removing the conductive material and a layer of the dielectric material from the bottom surface, said layer having a thickness related to the measurement; and

applying conductive material to the bottom surface of said dielectric means.

5,004,993

CONSTRICTED SPLIT BLOCK WAVEGUIDE LOW PASS FILTER WITH PRINTED CIRCUIT FILTER SUBSTRATE

John Reindel, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 19, 1989, Ser. No. 410,385

Int. Cl.[5] H01P *1/207*

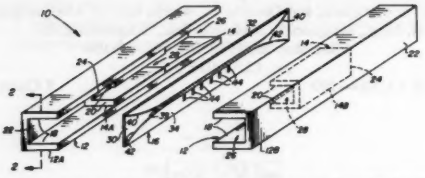
U.S. Cl. 333—208 **16 Claims**

1. A waveguide low pass filter, comprising:

(a) an outer waveguide;

(b) an inner waveguide shorter in length than, and disposed within, said outer waveguide so as to form a constriction

within said outer waveguide limiting the propagation of energy to the fundamental TE_{10} mode; and



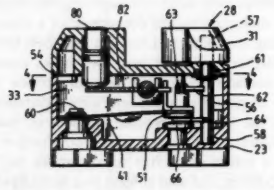
(c) a slotted ridge filter array mounted longitudinally through said outer and inner waveguides.

5,004,994

PUSH-TO-TRIP HIGH-AMP CIRCUIT BREAKER

Jacek M. Korczynski, Niles, and Thomas J. Stack, Chicago, both of Ill., assignors to Cooper Industries, Inc., Houston, Tex.

Filed May 24, 1990, Ser. No. 528,312
Int. Cl.[5] H01H *71/16*
U.S. Cl. 337—66 11 Claims



1. A high amperage circuit breaker comprising

a pair of spaced terminals being placed in series with the circuit to be protected;

a heat resistant electrical insulating plastic housing defining a body cavity, said body cavity having a base, a front wall, a rear wall and two side walls,

a cover to close said housing;

a rectangular thermally activated bistable mechanical element in said cavity, at least one dimple formed on said bistable element;

a first contact being connected to one of said terminals, said first contact also connected to one end of said bistable element by means wherein the one end of said bistable element always remains stationary with respect to the first contact and in electrical contact with the first contact;

a second electrical contact attached to the other end of said bistable element;

said other end of said bistable element being free to move in a relatively vertical direction;

a third contact electrically connected to said other terminal and being positioned relative to said second contact wherein said second and third contact are normally in electrical contact with each other when the bistable element is in a first position, and said first position being to close the circuit of the circuit breaker;

said bistable element having a predetermined current response to quickly deflect when there is a predetermined over current, said deflection causing said other end of said bistable element to move from said first position to a second position and to cause said second contact to separate from said third contact by a predetermined distance to open the circuit of the circuit breaker;

a reset mechanism to maintain the predetermined distance between said second contact and said third contact until the circuit breaker is manually reset; and

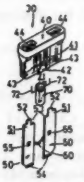
a manual trip means to open the circuit of the circuit breaker.

5,004,995

FUSE ASSEMBLY FOR CAR

Ying C. Lo, No. 46, Lane 130, Ming-Tzwu Rd., Miau-Li, Taiwan

Filed Mar. 22, 1990, Ser. No. 497,284
Int. Cl.[5] H01H *85/32*
U.S. Cl. 337—266 3 Claims



1. A fuse assembly for a car comprising:

a cross-sectionally generally rectangular hollow insulating housing including an open bottom, a central receiving room, two side receiving rooms both communicating with said central receiving room, said and a top **44**, said top having two diametrically opposite angulate surfaces **46**, and two through holes respectively communicating with said two side rooms;

two conducting plates respectively received in said two side rooms, respectively having two cornered surfaces **53** respectively complementary to said angulate surfaces, and each of which includes a first end inserted in one of said two top holes **44** and a second opposite end protruding beyond said open bottom to be adapted to be inserted to a fuse assembly socket for said car; and

a fuse positioned in said central room and having two ends thereof respectively connected to and integrally formed with said two conducting plates, in which:

said fuse assembly further includes an indicating bulb generally positioned in said central room and between said top and said fuse **60** and having two diametrically disposed electrodes **72** respectively generally positioned in said two side rooms and respectively having two U-shaped portions having two angled portions respectively firmly clamped between said cornered surfaces **53** and said angulate surface **46**, and

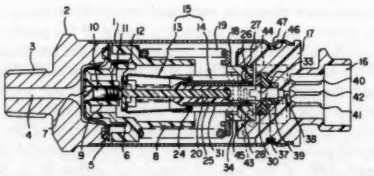
said top and said first ends of said two conducting plates clamp therebetween said two electrodes in order to generally position said indicating bulb in said central room.

5,004,996

HYDRAULIC ACTUATING APPARATUS

Toshiji Shibazaki; Masaru Okano; Naoto Kishida; Yoshihiro Ozaki, and Kunihiko Iyama, all of Saitama, Japan, assignors to Toyo Denso Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1989, Ser. No. 399,057
Claims priority, application Japan, Aug. 26, 1988, 63-111837[U]; Aug. 26, 1988, 63-111838[U]; Nov. 22, 1988, 63-152668[U]
Int. Cl.[5] H01C *10/10, 10/30*
U.S. Cl. 338—36 9 Claims



1. A hydraulic actuating apparatus for sensing hydraulic pressure, comprising:

a slider which is movable in proportion to the hydraulic pressure;

a variable resistor unit having a resistance value which changes in response to movement of said slider;

resilient means which is resiliently deformable by movement of said slider and which exerts a restoring force opposing the movement of said slider caused by said hydraulic pressure; and

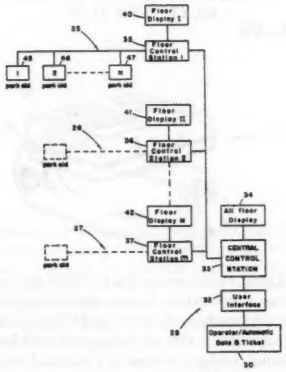
adjusting means for setting an initial resistance value of said variable resistor unit, said variable resistor unit having a portion which is in contact with said adjusting means.

5,004,997

PARKING AID DEVICE

Ben Z. Shisgal, Carmiel, and Tzvi Tzelnick, Tel Aviv, both of Israel, assignors to Insys Ltd., Carmiel, Israel

Filed Jan. 22, 1990, Ser. No. 468,292
Int. Cl.[5] B60Q *1/00*; G08G *1/14*
U.S. Cl. 340—436 **17 Claims**



1. An electronic parking-aid device for guiding a motorist when parking a vehicle in a parking bay, the device comprising:

a housing adapted to be fixed to a wall at an end of the parking bay and containing therein means for connecting to a source of electric power,

transmitter means for transmitting a first signal towards an approaching vehicle so as to reflect a second signal from an approaching surface of the vehicle,

receiver means for receiving the second signal,

computing means coupled to the transmitting and receiving means and responsive to the first and second signals for computing the distance of the approaching surface of the vehicle from the wall,

logic means coupled to the computing means for comparing the computed distance with a first predetermined threshold and generating a first output signal if the computed distance is less than the first threshold, and

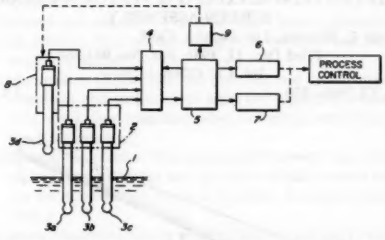
first indication means coupled to the logic means and responsive to the first output signal for indicating to the motorist to stop.

5,004,998

ION-MEASURING APPARATUS FOR USE IN PROCESS

Yoshio Horii, Miyanohigashi, Japan, assignor to Horiba, Ltd., Kyoto, Japan

Filed Dec. 7, 1989, Ser. No. 447,221
Claims priority, application Japan, Dec. 14, 1988, 63-316778
Int. Cl.[5] G08B *21/00*; G01N *27/26*
U.S. Cl. 340—507 **24 Claims**



1. An ion measuring apparatus for the monitoring of a sample from a production process, comprising:

a plurality of ion measuring electrodes for respectively measuring the ion content of the sample and providing an output measurement signal based on outputs from each of the electrodes;

means for determining a failure of one of the electrodes, and

means for excluding the failed electrode output form the output measurement signal

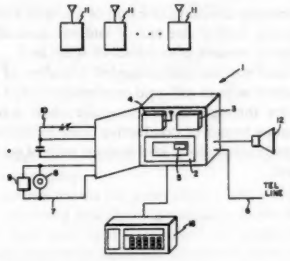
9. The ion measuring apparatus of claim 1 further including an alarm that is responsive to a detection of a failure of an electrode.

5,004,999

EXTENDED RF RANGE ALARM SYSTEM

Jon P. Hartmann, Santa Ana, and Ted W. Glasener, Orange, both of Calif., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Dec. 21, 1989, Ser. No. 454,329
Int. Cl.[5] G08B *1/08*
U.S. Cl. 340—539 **10 Claims**



1. An alarm system comprising:

a central control including an RF receiver for receiving message information from remote locations;

one or more RF transmitters for generating alarm message information to be transmitted to said receiver, each said transmitter comprising:

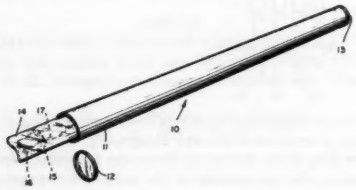
an RF energy generator for generating RF signals having an average signal strength which is a predetermined level;

a message source for providing said message information to modulate said RF signals; and

means for modulating said RF signals with said message information to produce modulated RF pulses of contiguous data bits, each of said pulses having an instantaneous level of RF field strength substantially greater than said

predetermined level and wherein said average signal is calculated over a cycle said cycle comprising the on-time of one of said pulses and the off-time between said pulses.

5,005,000
KIT CONTAINING COMPONENTS FOR AN ALARM SCREEN ASSEMBLY
Dennis E. Riordan, Los Angeles, Calif.
Filed Dec. 12, 1986, Ser. No. 941,166
Int. Cl.[5] G08B *13/00*
U.S. Cl. 340—550 **1 Claim**



1. A process for making an alarm screen mesh comprising the steps of:

a. weaving a screen mesh with a plurality of parallel strands of conductive wire so that each of said plurality of strands of conductive wire is interwoven into said screen mesh with each of said plurality of strands of conductive wire having a first end and a second end;

b. cutting a rectangular sheet from said screen mesh and trimming opposite sides of said rectangular sheet in order to leave projecting lengths of each of said plurality of parallel strands of conductive wire into said rectangular sheet;

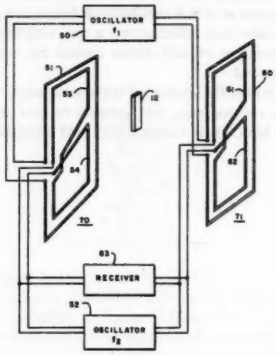
c. mechanically coupling alternating pairs of said first ends and second ends of said plurality of strands of conductive wire to adjacent strands of conductive wire in order to form a mechanically-coupled plurality of strands of conductive wire to form a sinuous path in said rectangular sheet;

d. mechanically coupling one end of a continuous strand of conductive wire to one end of said mechanically-coupled plurality of strands of conductive wire; and

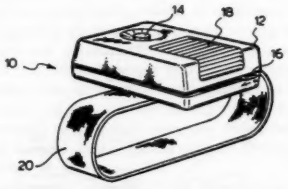
e. using said mechanically-coupled plurality of strands of conductive wire to pull said continuous strand of conductive wire through said rectangular sheet whereby said continuous strand of conductive wire is interwoven into said screen mesh along said sinuous path of said rectangular sheet.

5,005,001
FIELD GENERATION AND RECEPTION SYSTEM FOR ELECTRONIC ARTICLE SURVEILLANCE
Robert A. Cordery, Danbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.
Filed Apr. 5, 1990, Ser. No. 505,079
Int. Cl.[5] G08B *13/24*
U.S. Cl. 340—551 **4 Claims**

1. In a system for detecting the presence of a ferromagnetic marker in an interrogation zone, including first and second generating means for generating first and second magnetic fields, respectively, at first and second frequencies, respectively, and wherein said second frequency is substantially lower than said first frequency, the improvement wherein said first generating means comprises means for generating an alternating field at said first frequency and said second generating means comprises means for generating a rotating field at said second frequency.



5,005,002
HAND HELD SAFETY SIREN
Rachel Halperin, 100 Antibes Drive, Suite 1105, North York, Ontario, M2R 3N1, Canada
Filed Jan. 5, 1990, Ser. No. 461,413
Int. Cl.[5] G08B *15/00*
U.S. Cl. 340—574 **2 Claims**



1. A hand held alarm device for personal use comprising a housing having a top surface, bottom surface and side surfaces, an alarm circuitry contained within said housing and a activating switch located on the op surface of said housing, said activating switch being provided in a recessed area surrounding said switch, said recessed area being enlarged relative to said switch, said housing having a attaching means for releasably attaching the alarm device to a hand such that the activating switch is maintained in a position to be within reach of the fingers of a user, even after a fright response.

5,005,003
METHOD OF DETECTING FIRE IN AN EARLY STAGE
Peter Ryser, Stafa, and Sigfrid Strassler, Baden-Dattwil, both of Switzerland, assignors to Cerberus AG, Switzerland
Filed Mar. 29, 1989, Ser. No. 330,187
Claims priority, application Switzerland, Mar. 30, 1988, 1193/88; Dec. 23, 1988, 4760/88
Int. Cl.[5] G08B *17/00*
U.S. Cl. 340—587 **25 Claims**

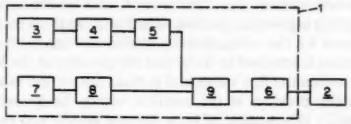
1. A fire alarm for the early detection of fires comprising:

a first sensing means for sensing a first fire related phenomenon having a first electrical output, where said first sensing means is sensitive to temperature fluctuations having frequency components in the range of 0.1 to 20 Hz;

a second sensing means for sensing a second fire related

phenomenon, different from the first fire related phenomenon, having a second electrical output;

a means for combining the first and second electrical output from the first and the second sensing means respectively for generating a third output;



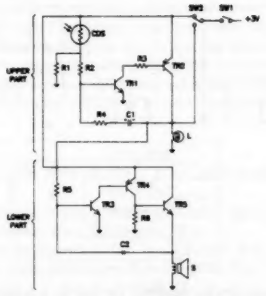
and a housing containing the first sensing means having means for optimizing the flow of air to the first sensing means.

5,005,004

LIGHT ACTIVATED VEHICLE SENSOR WITH FLASHING LIGHT AND PULSING SOUND ALARM

Michael P. Udofot, 1346 LaSalle Ave. S., Minneapolis, Minn. 55403

Filed Oct. 21, 1988, Ser. No. 260,597
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—600 **5 Claims**



1. A light activated signaling system for detecting the presence of a lighted moving vehicle and signaling the presence of the signaling system to the operator of the moving vehicle and for indicating the presence of the moving vehicle to the operator of the signaling system comprising:

a power supply for powering said system, said power supply having a positive supply terminal and a ground potential terminal;

light detector means responsive to light projected by said moving vehicle, for generating a light detection signal in response to the reception of light projected from said moving vehicle;

first oscillator means having an on state and an off state, connected to said power supply and also coupled to said light detector means for generating first repetitive power pulses at a first frequency, during said on state in response to said light detection signal, and not generating said repetitive power pulses, during said off state representative of the absence of said light detection signal,

light source means connected to said first oscillator means for converting said first repetitive power pulses to light pulses and for projecting said light pulses toward said moving vehicle;

second oscillator means coupled to said first oscillator means for generating second power pulses at a second fixed frequency higher than said first frequency, in response to said on state,

said second oscillator means operating during the one state of said first oscillator means and not operating during said off state;

audio transducer means coupled to said second oscillator means for converting said second power pulses to sound energy,

wherein said light detector means comprises,

a photo resistive detector (CDS) connected in series with a variable resistor (R_1) across said power supply terminal (+3,gnd) the junction between said photo-resistive detector and said variable resistor defining a control node, wherein said first oscillator means comprises

a first npn transistor (TR_1) having a base, a collector and an emitter;

a second npn transistor (TR_2) having a base, a collector and an emitter, said emitter being connected to said positive supply terminal (+3V);

a bias resistor (R_2) connected between said base of said first transistor and said control node for supplying a bias current to said first transistor when said photo-resistive detector is illuminated;

a base supply resistor (R_3) connected between said collector of said first transistor and said base of said second transistor for supplying current to the base of second transistor (TR_2);

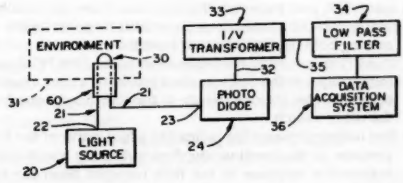
a series connected timing resistor (R_4) connected to a timing capacitor (C_1) forming a feed base path connected between said base of said first transistor (TR_1) and said collector of said second transistor (TTR_2), whereby said first repetitive power pulses are produced at said first frequency, whereby said first frequency is proportional to the time constant of said feedback path, at said collector of said second transistor (TR_{10}) when said photo-resistive detector biases said first transistor TR_1 into conduction.

5,005,005

FIBER OPTIC PROBE SYSTEM

Charles E. Brossia, 1748 E. Ross La., Highlands Ranch, Colo. 80126, and Samuel C. Wu, 10205 W. Exposition Ave., Lakewood, Colo. 80226

Continuation-in-part of Ser. No. 838,283, Mar. 10, 1986, Pat. No. 4,851,817. This application Mar. 1, 1989, Ser. No. 317,426
Int. Cl.[5] G08B *21/00, 19/02*
U.S. Cl. 340—604 **18 Claims**



1. A system for detection of a selected medium in an environment comprising:

a light source means for generating a beam of light;

a light receiving and signal generating means for receiving light from said light source and for generating variable signals dependent upon the amount of light received;

optical path means made of a continuous uninterrupted length of transparent material for connecting said light source means to said light receiving and signal generating means and for providing a continuous light path therebetween for transmitting said beam of light from said light source means to said light receiving means along the optical path;

at least one sensor portion located on a peripheral outer surface of said optical path means and in contact with the environment and being constructed and arranged to cause change in intensity of light transmitted through said sensor portion dependent on the amount of selected medium in the environment adsorbed and absorbed by the sensor portion, whereby variable output signals generated by

said light receiving and signal generating means vary in accordance with the amount of selected medium in the environment adsorbed and absorbed by the sensor portion; and

signal processing and indicating means connected to said light receiving and signal generating means for output signaling and for indicating the detection of the selected medium in the environment.

5,005,006

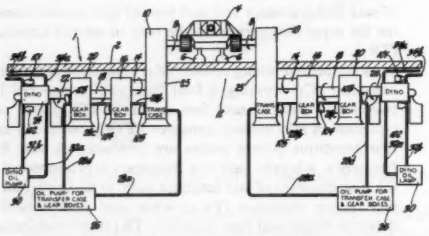
ELECTRONIC CONTROL FOR A FLUID SYSTEM

Kenneth W. Ratcliff, 21035 Lantz, Mt. Clemens, Mich. 48043

Filed Jan. 5, 1990, Ser. No. 461,565

Int. Cl.[5] G08B *21/00*

U.S. Cl. 340—611 **9 Claims**



1. An electronic device for monitoring pressure in a system of fluid circuitry in a machine, the fluid circuitry having at least one location where fluid pressure is monitored, the electronic device comprising:

a set of at least two switches at the location, one of the switches actuated when pressure at the location is within a first range, another of the switches actuated when pressure at the location is within a second range, the set being capable of giving four responses, wherein the one switch gives a first response when not actuated and gives a second response when actuated, and wherein the other switch gives a third response when not actuated and gives a fourth response when actuated;

a first NOR gate receiving the responses from the switches, the first NOR gate outputting a fifth response when receiving both the first response from the one switch and the third response from the other switch, the first NOR gate outputting a sixth response when receiving either a second response from the one switch or the fourth response from the other switch;

a first indicator means for indicating a first status of the fluid pressure at the location, the first indicating means being actuated in response to the fifth response from the first NOR gate;

a second NOR gate, the second NOR gate receiving the third and fourth responses from the other switch and receiving the fifth and sixth responses from the first NOR gate, the second NOR gate outputting a seventh response when receiving both the third response from the other switch and the sixth response from the first NOR gate, the second NOR gate outputting an eighth response when receiving either the fourth response from the other switch or the fifth response from the first NOR gate;

a second indicator means for indicating a second status of the pressure at the location, the second indicator means actuated in response to the seventh response from the second NOR gate;

a third indicator means for indicating a third status of the fluid pressure at the location, the third indicator means actuated in response to the fourth response of the other switch;

whereby pressure at the location outside both the first range and the second range results in actuation of neither the one nor the other switch, so that the one switch sends the first response while the other switch sends the third response, so that the first indicator means is actuated to show that the pressure at the location is outside both the first range and the second range;

whereby pressure at the location within the first range and outside the second range results in actuation of the one switch but not the other switch, so that the second response is given by the one switch and the third response is given by the other switch, so that the second indicator means is actuated to show that the pressure at the location is within the first range and outside the second range; and

whereby pressure at the location within the second range results in actuation of both the one switch and the other switch, so that the one switch gives the second response and the other switch gives the fourth response, so that the third indicator means is actuated to show that pressure at the location is within the second range.

5,005,007

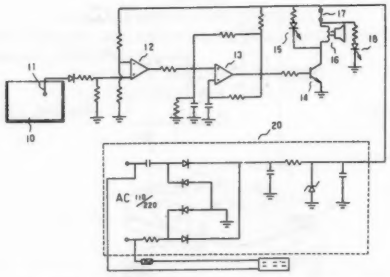
ALARM DEVICE FOR MARINE TANK

Kuo-Lianq Weng, and Kuo-Liang Weng, both of Taichung Hsien, Taiwan, assignors to Yu Li Enterprise Co. Ltd., Taiwan

Filed May 10, 1990, Ser. No. 521,785

Int. Cl.[5] G08B *21/00*

U.S. Cl. 340—650 **1 Claim**



1. An alarm device adapted for use in a household marine tank with accessory equipment so as to indicate to an operator an electric leakage or a poor insulation condition, comprising a sensor means in serial connection to an alarm circuit controlled by a capacitor exchange type power circuit which has a receptacle for receiving plugs from the accessory equipment such as an illumination light, air pump, water temperature controller, and filter means, and said power circuit being connected to a power source; wherein the range of detection of electric leakage is from 0.1 to 1 mA, and an indication of a poor insulation condition is given at a measurement of substantially 3.3 mΩ; whenever either electric leakage occurs inc said range, or a poor insulation condition is detected, a buzzer means and an indicator light will be actuated to keep the operator alert; by disconnecting one by one the plugs of said accessory equipment to see if the light and buzzer means cease actuation, the operator can locate a trouble spot with certainty.

5,005,008

METHOD AND APPARATUS FOR PROVIDING THERMODYNAMIC PROTECTION OF A DRIVER CIRCUIT USED IN AN IN-CIRCUIT TESTER

Philip N. King, Fort Collins, Colo., assignor to Hewlett Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 340,993, Apr. 20, 1989, abandoned. This application Jun. 26, 1990, Ser. No. 544,024

Int. Cl.[5] G08B *21/00*

U.S. Cl. 340—653 **7 Claims**

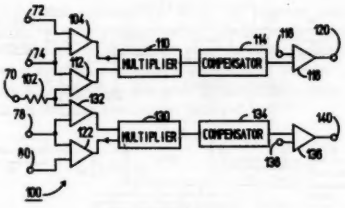
1. Apparatus for maximizing operating time while preventing damage to a transistor, or similar active device, contained

in the output stage of a driver circuit in an overdrive/functional tester, comprising:

first sensing means for sensing the current in said output stage transistor, or similar active device;

second sensing means for sensing the voltage in said output stage transistor, or similar active device;

multiplication means for multiplying said sensed current with said sensed voltage and for generating a power signal representative of such multiplication;



thermodynamic model means, connected to receive said power signal, for compensating said power signal to account for the thermodynamic characteristics of said transistor, or similar active device, so that comparison of said power signal to a power reference value does not result in an indication of excessive dissipated power during heat build up in said transistor or an indication that said transistor is ready to dissipate power during heat decay; and

comparison means for comparing the compensated power signal with a power reference value and for generating an indication signal reflective of said comparison.

5,005,009

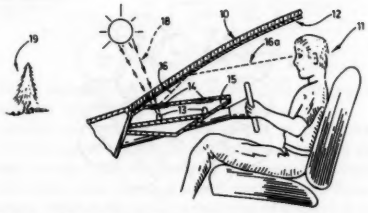
METHOD AND APPARATUS FOR MULTIPLE OBJECT VIEWING

John K. Roberts, Camp Pendleton, Calif., assignor to K. W. Muth Company, Inc., Sheboygan, Wis.

Continuation-in-part of Ser. No. 156,122, Feb. 16, 1988, abandoned. This application Feb. 15, 1989, Ser. No. 310,644

Int. Cl.[5] G02B *27/16*

U.S. Cl. 340—705 **23 Claims**



1. An instrument display apparatus comprising:

a transparent sheet,

a thin transparent enhancing film made integral with the transparent sheet and which is operable to attenuate preselected wavelengths of light which strike the enhancing film and which originate from all directions, the enhancing film providing unrestricted viewing through the transparent sheet in all directions; and

an instrument to be displayed disposed in proximity to the enhancing film and which is adapted to produce light in the selected wavelengths which are attenuated by the enhancing film whereby the image of the instrument appears in the enhancing film, and wherein the enhancing film further attenuates the selected wavelengths of light which originate from locations other than the instrument whereby the contrast of the image appearing in the enhancing film is improved relative to the background ambient lighting conditions.

5,005,010

HEAD-UP DISPLAY FOR MOTOR VEHICLES

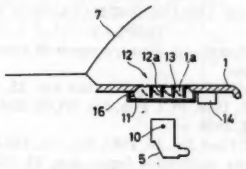
Takashi Misaki, Susono, and Hitoshi Aoki, Numazu, both of Japan, assignors to Yazaki Corporation, Japan

Filed Mar. 18, 1988, Ser. No. 169,695

Claims priority, application Japan, Mar. 18, 1987, 62-038509

Int. Cl.[5] G09G *3/02*

U.S. Cl. 340—705 **11 Claims**



1. A head-up display for a motor vehicle having a dashboard with a top surface which is provided with an aperture, which comprises:

a transparent member provided within said aperture in said top surface of said dashboard;

means for projecting an image of visual information through said transparent member provided in said aperture, said projecting means being enclosed in said dashboard;

reflection means for producing the image of the visual information thereon; and

means for preventing reflection of light entering from the outside of said vehicle on said transparent member, said reflection preventing means being associated with said aperture and shiftable between a first position covering said transparent member by closing said aperture and a second position uncovering said transparent member by opening said aperture.

5,005,011

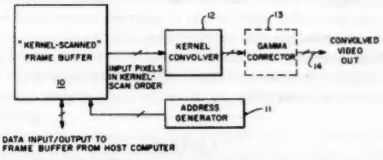
VERTICAL FILTERING APPARATUS FOR RASTER SCANNED DISPLAY

Stephen G. Perlman, Mountain View; Jerome M. Okun, Campbell; John H. Palevich, Sunnyvale, and James A. Lundblad, Santa Clara, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Dec. 23, 1988, Ser. No. 290,182

Int. Cl.[5] G09G *5/10, 1/14*

U.S. Cl. 340—728 **18 Claims**



1. In a raster-scanned video display for a computer where data for the display is stored in a frame buffer, and where the data is organized in the frame buffer by scan lines with data being stored for each pixel along each scan line, an improved method for generating filtered pixel data for a first display line, comprising:

(a) storing the pixel data in a frame buffer having a first and a second bank of video RAMs with pixel data for scan lines **2, 3, 6, 7, 10, 11** . . . being stored in said first bank and

pixel data for scan lines 0, 1, 4, 5, 8, 9 . . . being stored in said second bank;

(b) reading from said buffer the pixel data for a first pixel of the n, n+1, n+2 . . . n+N scan lines before reading from said buffer the pixel data for subsequent pixels of said n, n+1, n+2 . . . n+N scan lines;

(c) convolving the pixel data for said first pixel of said n, n+1, n+2 . . . n+N scan lines to provide said filtered pixel data for said first pixel of said first display line;

(d) repeating steps (b) and (c) for each subsequent pixel on said first display line.

5,005,012

METHOD OF ARRANGING DATA ON A RAM FOR DISPLAY

Kunio Kanda, Kokubunji, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

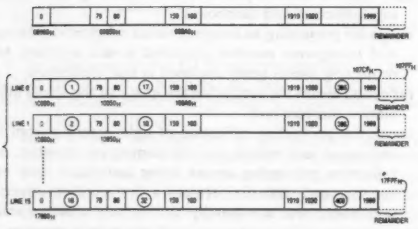
PCT No. PCT/JP87/00522, § 371 Date Apr. 15, 1988, § 102(e) Date Apr. 15, 1988, PCT Pub. No. WO88/01420, PCT Pub. Date Feb. 25, 1988

PCT Filed Jul. 16, 1987, Ser. No. 184,486

Claims priority, application Japan, Aug. 22, 1986, 61-196900

Int. Cl.[5] G09G *1/16*

U.S. Cl. 340—750 **7 Claims**



1. A method of data arrangement in a memory for a display in which character data and graphical data are overlappingly displayed in plural rows, each of the rows includes plural lines and the memory including addresses having high-order and low-order address bits, comprising the steps of:

(a) dividing the graphic data into blocks, each of said blocks corresponding to a respective one of the rows and dividing each of said blocks into sub-blocks, each of said sub-blocks corresponding to a respective one of the lines;

(b) arranging in the memory the character data in the order of the rows;

(c) arranging in the memory said blocks in the order of the rows and arranging said sub-blocks so that the addresses associated with a respective one of said sub-blocks within a respective block have the same low-order address bits as the low-order address bits of addresses associated with a corresponding row of character data; and

(d) performing an address transition from one sub-block to another sub-block of the same block by shifting the high-order address bits.

5,005,013

PAGER WITH A DISPLAY FUNCTION

Akihiro Tsukamoto, and Keiichi Kobayashi, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jul. 14, 1988, Ser. No. 219,348

Claims priority, application Japan, Jul. 16, 1987, 62-176047; May 12, 1988, 63-115319

Int. Cl.[5] G08B *5/22*

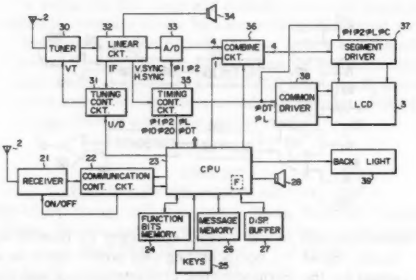
U.S. Cl. 340—825.44 **4 Claims**

1. A pager comprising:

radio receiving means for receiving and demodulating a modulation signal including an identification number and message data;

identification number memory means for storing a self identification number;

reception control means for discriminating whether the received identification number coincides with the identification number stored in said memory means, and for, if a coincidence is detected, reading the received message data;



message memory means for storing the message data read by said reception control means;

means for designating a display color; and

color display means for displaying the message data stored in said message means as a color designated by said display color designating means;

wherein said designating means comprises means for designating said display color in accordance with the amount of time which has elapsed since the reception of the message data.

5,005,014

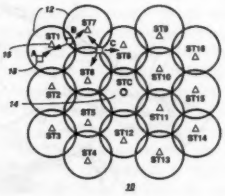
SYSTEM AND METHOD FOR OPTIMALLY TRANSMITTING ACKNOWLEDGE BACK RESPONSES

Leon Jasinski, Ft. Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 22, 1989, Ser. No. 354,568

Int. Cl.[5] G08B *5/22*

U.S. Cl. 340—825.44 **15 Claims**



1. A method for providing system acknowledge back responses from a plurality of remote stations to a central station, the system acknowledge back responses including a predetermined station identification number assigned to each remote station and any individual acknowledge back responses received by each remote station from a plurality of portable communication receivers operating in the system, the station identification numbers being assigned to each remote station beginning with a first remote station number and ending with a last remote station number in a predetermined sequential order, said method comprising the steps of:

generating a start signal and transmitting the same from the central station to initiate the transmission of system acknowledge back responses from the plurality of remote stations;

transmitting, from the first remote station, the system ac-

knowledge back response in response to the first remote station receiving the start signal;

transmitting, from each subsequent remote station in the predetermined sequential order, the system acknowledge back response in response to the subsequent remote station receiving the predetermined station identification number of the previous remote station;

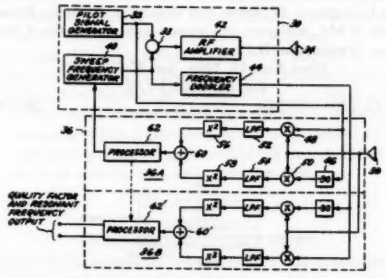
monitoring the progression of transmitted system acknowledge back responses at a selected station from the remote station in the predetermined sequential order; and

generating and transmitting from the selected station, a request to acknowledge which includes the predetermined station identification number of the previous remote station in response to subsequent remote station failing to respond in the predetermined sequential order within a predetermined time interval.

5,005,015
ICE DETECTION SYSTEM

Rudolph A. Dehn, Schenectady, and Andrew J. Macdonald, Ballston Spa, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 7, 1989, Ser. No. 390,125
Int. Cl.[5] G08B *21/00*; B64D *15/00*
U.S. Cl. 340—962 **13 Claims**



1. An ice detection system for detecting the state and thickness of water overlying a surface, comprising:

a plurality of resonant circuits spaced at predetermined locations about an electrically conductive surface, each of said circuits consisting entirely of a respective cutout in said surface and having a preselected resonant frequency which varies in response to thickness of overlying ice and liquid water;

variable frequency generating means for generating a transmission signal which can be varied about the resonant frequency of each of said circuits to cause each of said circuits to generate a resonant frequency signal in response to said transmission signal;

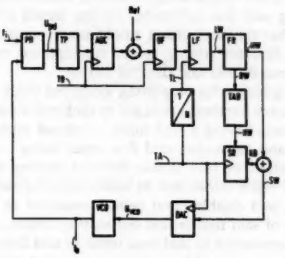
receiver means tunable to the resonant frequency of each of said circuits, said receiver means including means for identifying the resonant frequency of each of said circuits and for determining the quality factor of each of said circuits from the resonant frequency signals produced by the respective circuits; and

processing means responsive to the identified resonant frequency and determined quality factor for each of said circuits, for determining the state and thickness of water overlying each of said circuits.

5,005,016
HYBRID PHASE-LOCKED LOOP

Konrad Schmidt, Ellingen, and Ralf Kramer, Nuremburg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1990, Ser. No. 500,447
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1989, 3910703
Int. Cl.[5] H03M *1/00*
U.S. Cl. 341—142 **20 Claims**

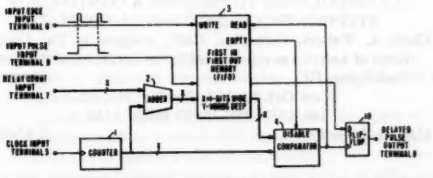


1. Phase-locked loop comprising a phase detector, an analog-to-digital converter, a digital loop filter, a digital-to-analog converter and a voltage-controlled oscillator, characterized in that a fractionizer is inserted after the digital loop filter that is operating at a first clock, which fractionizer produces a main value and a residual value and in that means are provided for deriving a correction value from the residual value and for applying the sum of the main value and a correction bit derived from the correction value is applied to the digital-to-analog converter that is operating at a second clock.

5,005,017
MULTIPLE PULSE DELAY PROCESSOR

Gary J. Sikora, Columbia, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 13, 1990, Ser. No. 508,455
Int. Cl.[5] G01S *7/40*
U.S. Cl. 342—172 **3 Claims**



1. An apparatus for delaying a series of input pulses received on an input pulse input terminal and for outputting delayed pulses onto a delayed pulse output terminal, the apparatus allowing multiple input pulses to be simultaneously delayed, comprising:

counting means for outputting a binary number indicative of current time, said counting means having an input, and an output, said input being connected to a clock input terminal;

adding means for adding binary numbers, said adding means having a first input, a second input, and an output, said first input being connected to said output of said counting means, said second input being connected to a delay count input terminal, said adding means providing at its output a binary number which represents the sum of its first and second inputs;

first-in-first-out storing means for storing binary numbers,

said first-in-first-out storing means having a write input, a data word input, a data bit input, a read input, a data word output, a data bit output, and an empty output, said write input being connected to an input edge input terminal for pushing values on said data word input onto said first-in-first-out storing means upon the occurrence of each input edge of each individual input pulse of said series of input pulses, said data word input being connected to said output of said adding means, said data bit input being connected to the input pulse input terminal so that the level to which the input pulse went following each input edge is stored in the first-in-first-out storing means, said read input causing said first-in-first-out storing means to be popped such that the next oldest stored binary numbers of said first-in-first-out storing means is outputted on said data word output and said data bit output;

comparing means for outputting a delayed clock edge when two binary numbers are equal to each other, said comparing means having a first input, a second input, a disable input, and an output, said first input being connected to said output of said first-in-first-out storing means, said second input connected to said output of said counting means, said disable input being connected to said empty output of said first-in-first-out storing means, said output being connected to said read input of said first-in-first-out storing means, said comparing means outputting said delayed clock edge when said output of said counting means equals said data word output of said first-in-first-out storing means, said comparing means outputting each delayed clock edge such that the delay time from the input edge to the corresponding delayed clock edge approximately equals the amount of time required for said counting means to count the number of clock periods on said delay count input terminal when said input edge occurred; and

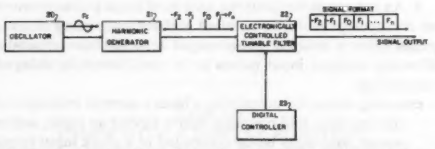
clocked storage means for changing the level of the signal on the delayed pulse output terminal upon the occurrence of a delayed clock edge, said clocked storage means having a data input, a clock input, and a data output, said clock input being connected to said output of said comparing means, said data input being connected to said data bit output of said first-in-first-out storing means, said data output being connected to the delayed pulse output terminal.

5,005,018

(U) MODULATOR TO PROVIDE A CONTINUOUS STEPPED FREQUENCY SIGNAL FORMAT

Glenn A. Walters, Escondido, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, DC

Filed Oct. 6, 1982, Ser. No. 440,392
Int. Cl.[5] G01S *13/00*; H03C *3/12*
U.S. Cl. 342—203 **2 Claims**



1. An apparatus for eliminating ringing between an input terminal and an output terminal in a stepped frequency format comprising:

a harmonic generator coupled to the input terminal;

a first resonant circuit coupled to the input terminal to receive at least a first and a second frequency from the harmonic generator for selectively resonating at the first frequency and the second frequency, the first resonant circuit having an electric signal influenced variable reactance impedance coupled in parallel with a fixed reactance impedance;

a second resonant circuit coupled to the first resonant circuit for selectively resonating at the second frequency and the first frequency and having an output connected to the output terminal, the second resonant circuit having an electric signal influenced variable reactance impedance coupled in parallel with a fixed reactance impedance;

means for providing an electric signal source at at least two levels;

a switch coupled to the electric signal influenced variable reactance impedance of the first and second resonant circuits and the electric signal providing means for selectively switching between the two levels thereby assuring the alternate selective resonance at the first frequency simultaneously by the first and second resonant circuits and the second frequency simultaneously by the first and second resonant circuits; and

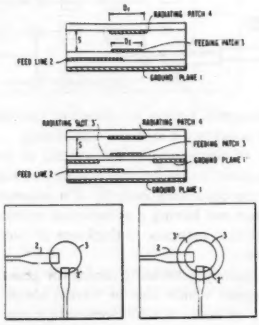
a pair of radio frequency chokes each coupling a separate resonant circuit to the electric signal providing means and switch, the electric signal providing means is a potential source and the electric signal influenced variable reactance impedance is a varactor.

5,005,019

ELECTROMAGNETICALLY COUPLED PRINTED-CIRCUIT ANTENNAS HAVING PATCHES OR SLOTS CAPACITIVELY COUPLED TO FEEDLINES

Amir I. Zaghloul, Bethesda, and Robert M. Sorbello, Potomac, both of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed Nov. 13, 1986, Ser. No. 930,187
Int. Cl.[5] H01Q *1/00*
U.S. Cl. 343—700 MS **29 Claims**



10. A microstrip antenna, comprising:

a plurality of feedlines;

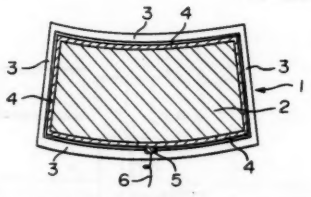
a plurality of feeding elements, each coupled in a contactless manner to at least a respective one of said plurality of feedlines, said feeding elements being impedance matched with said feedlines; and

a plurality of radiating elements, each coupled in a contactless manner to a respective one of said plurality of feeding elements, wherein said feedlines are capacitively coupled to said feeding elements and said feeding elements are capacitively coupled to said radiating elements.

5,005,020
TRANSPARENT GLASS ANTENNA FOR AN AUTOMOBILE

Masanobu Ogawa, and Shinya Shibata, both of Aikawa, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 145,102, Jan. 19, 1988, abandoned. This application Jun. 25, 1990, Ser. No. 542,659
Claims priority, application Japan, Jan. 20, 1987, 62-5508[U]; May 18, 1987, 62-72860[U]
Int. Cl.[5] H01Q *1/32*
U.S. Cl. 343—713 3 Claims



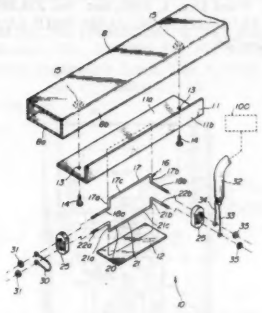
1. A transparent antenna for an automobile, comprising:
a window glass panel;
an infrared reflecting transparent conductive film integrally formed with said window glass panel;
said transparent conductive film covering said window glass panel except for a blank region of glass having a predetermined width of at least 10 mm around the periphery of said window glass panel, the transparent conductive film having a surface resistance ranging from 4Ω/□ to 500Ω/□;
a busbar formed on said window glass panel around said transparent conductive film and connected to said transparent conductive film at substantially the entire periphery of said transparent conductive film; and
a current feeding terminal connected to said busbar;
wherein said window glass panel is a laminated glass panel formed by laminating at least two glass plates between which an interlayer film is placed, and said transparent conductive film is provided on the inner surface of one of said glass plates facing the outside of an automobile so as to be in contact with said interlayer film.

5,005,021
ANTENNA UNIT FOR VEHICLE

Koichiro Kato; Hiroshige Fukuhara; Hiroyuki Kamishima, and Hitoshi Tsukahara, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 4, 1989, Ser. No. 389,448
Claims priority, application Japan, Aug. 8, 1988, 63-196146
Int. Cl.[5] H01Q *1/32*
U.S. Cl. 343—717 17 Claims

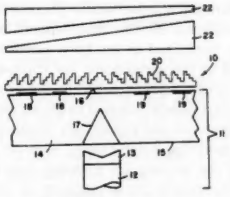
1. An antenna unit for a vehicle comprising:
an antenna element member;
a grounding plate located on the underside of the vehicle;
a first supporting member fixed on said antenna element, said first supporting member having first and second end portions;
a second supporting member fixed on said grounding plate, said second supporting member having first and second end portions;
resilient connectors, made of insulating materials, non-conductively connecting the first and second end portions of said first supporting member to the first and second corresponding end portions of said second supporting member respectively so as to suspend said antenna element member from said grounding plate, respective first end portions of said first and second supporting members being provided as terminals for feed; and
a wire, having a predetermined length, electrically connecting respective second end portions of said first and second supporting members to adjust the impedance of the antenna unit so as to tune it to appropriate operation frequencies.



5,005,022
MICROWAVE ANTENNA

Leonard L. Blaisdell, Medway, Mass., assignor to GTE Government Systems Corporation, Waltham, Mass.

Filed Dec. 29, 1989, Ser. No. 459,004
Int. Cl.[5] H01Q *019/060, 013/000*
U.S. Cl. 343—753 14 Claims



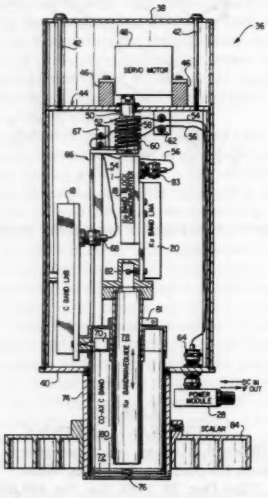
1. An antenna comprising:
a sheet of dielectric material having a first surface and a parallel second surface;
a tapered recess in said dielectric material converging from said first surface towards said second surface and having an axis orthogonal to said second surface;
said dielectric material having a critical angle of reflection with respect to said axis;
a RF horn arranged nearer said first surface and having an axis in common with the axis of said tapered recess;
a RF lens interposed between said horn and said tapered recess; said RF horn RF lens, tapered recess, and dielectric material having RF optical properties such that all rays traced from said horn through said lens and dielectric material to said second surface have an angle with respect to said normal of said second surface greater than said critical angle and RF energy on said second surface from the center of said horn is in phase with RF energy on said second surface from the edge of said horn for launching a surface wave on said second surface; and
perturbing means for causing said surface wave on said second surface to leak in order to produce a radiating aperture with a desired illumination characteristic.

5,005,023

DUAL BAND INTEGRATED LNB FEEDHORN SYSTEM

James M. Harris, Terrell, Tex., assignor to Gardiner Communications Corporation, Garland, Tex.

Filed Dec. 1, 1988, Ser. No. 278,589
Int. Cl.[5] H01Q *19/00, 13/00;* H01P *1/16, 5/12*
U.S. Cl. 343—756 5 Claims



1. A multi-band integrated LNB feedhorn system comprising: a housing having a body portion and first and second ends, a first support means attached to the housing adjacent to the first end for forming a drive motor portion of the housing, a servomotor mounted on the first support means, a second support means contained in the body portion of the housing and connected to the servomotor for rotation, a plurality of power modules exteriorly attached to the housing, a plurality of low noise block means attached to the second support means for rotation therewith and electrically connected to the plurality of power modules, a cup-shaped member attached to the second end of the housing for forming with a portion of the housing a compartment for a plurality of waveguide means including a plurality of energy output coupling means electrically connected to the plurality of low noise block means, and first and second waveguide means attached to the second support means for rotation therewith, a focusing means, the first waveguide means connected to the focusing means for focusing modulated RF signals at a first band received from an antenna, a defocusing means, the second waveguide means connected to the defocusing means for defocusing modulated RF signals at a second band received from the antenna,

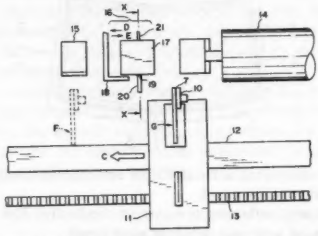
whereby with the band of the first waveguide means being focused and the band of the second waveguide means being defocused and the second support means rotated by the servomotor to align the first and second waveguide means and plurality of low noise block means with the polarization of incoming modulated RF energy, the first and second waveguide means and plurality of low noise block means combine to perform the polarizer function thereby alleviating the need for additional polarizing elements and their power loss to provide a power savings sufficient for a wider than typical half power beamwidth for increasing the aiming accuracy while compensating for the defocusing of the band of the second waveguide means without substantially affecting its gain.

5,005,024

INK JET RECORDING APPARATUS WHICH SUPPLIES REPELLENT AGENT TO LIQUID DISCHARGE PORT SURFACE AND METHOD THEREOF

Hiroto Takahashi, Atsugi; Seiichiro Karita, Yokohama, and Koichi Sato, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 174,815, Mar. 29, 1988, abandoned. This application Mar. 2, 1990, Ser. No. 489,831
Claims priority, application Japan, Mar. 31, 1987, 62-076352; Mar. 14, 1988, 63-0760102; Mar. 14, 1988, 63-0760105
Int. Cl.[5] B41J *2/165, 2/05*
U.S. Cl. 346—1.1 53 Claims



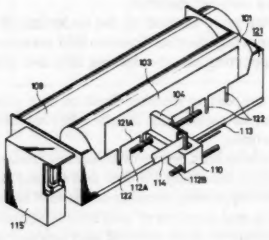
1. A liquid injection recording apparatus adapted to discharge recording liquid from discharge ports provided in a discharge port surface of a recording head to make flying liquid droplets to thereby accomplish recording, comprising a recording head having a discharge port surface with discharge ports provided therein and liquid-repellent process means capable of applying a liquid-repellent agent to said discharge port surface for repelling the recording liquid adhering to said discharge port surface provided at a position capable of being opposed to said discharge port surface, said liquid injection recording apparatus further comprising reciprocating means for reciprocally moving said recording head a plurality of times after said liquid-repellent agent is applied to said discharge port surface and before said recording apparatus accomplishes further recording.

5,005,025

PRINTER HAVING MEANS FOR HEATING A RECORDING SHEET AND FIXING INK THEREON

Akira Miyakawa, Tanashi, and Hiroyuki Inoue, Chiba, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 202,568, Jun. 6, 1988, abandoned. This application Aug. 13, 1990, Ser. No. 566,311
Claims priority, application Japan, Jun. 12, 1987, 62-146376; Jul. 7, 1987, 62-167827
Int. Cl.[5] B41V *2/01*
U.S. Cl. 346—25 13 Claims



1. A printer comprising:

ink jet recording means for recording on a recording sheet;

means for providing a conveyance route for conveying the recording sheet through a recording area where said

recording means is opposed to the recording sheet and records on the recording sheet, said means comprising a heating member for contacting the recording sheet to heat the recording sheet; and

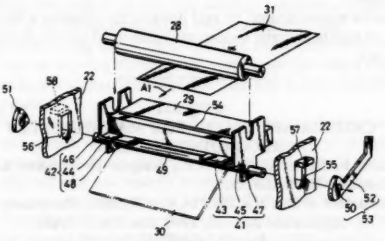
a press plate, disposed upstream of the recording area with respect to the conveying route, for pressing the recording sheet to said heating member, said press plate having a portion opposed to said heating member and a plurality of spaced apart slots spaced apart from each other in a direction perpendicular to a conveying direction of the recording sheet.

5,005,026

THERMAL HEAD SEPARATING MECHANISMS

Katsuyuki Sakai, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 13, 1990, Ser. No. 493,002
Claims priority, application Japan, Mar. 17, 1989, 1-66965
Int. Cl.[5] G01D *15/10*
U.S. Cl. 346—76 PH **19 Claims**



1. A thermal recording apparatus for recording information onto thermosensitive recording paper, comprising:

a body;

a roller, including a shaft, rotatably connected to said body, for transporting the thermosensitive recording paper in a first direction;

a thermal head within said body, capable of moving in a second direction perpendicular to said first direction and including a plurality of heating resistance elements;

said thermosensitive recording paper being transported between said plurality of heating resistance elements and said roller during said recording;

pushing means for biasing said thermal head to push said thermosensitive recording paper into contact with said roller during said recording;

a cam, operatively connected to said thermal head, capable of angularly displacing said thermal head, said cam including a cam face;

contact members connected to said body, contacting said face at a contact point during the angular displacing of said cam and displacing said thermal head a predetermined distance from said thermosensitive recording paper and said roller, opposing the biasing force of said pushing means,

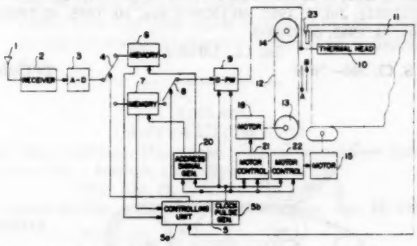
said plurality of heating resistance elements of said thermal head being positioned so as to be linearly arranged along a line including the shaft of said roller and the contact point.

5,005,027

THERMAL RECORDER

Hisaichi Oshima, Minoo, and Masami Yamashita, Takarazuka, both of Japan, assignors to Furuno Electric Co., Ltd., Hyogo, Japan

Continuation of Ser. No. 128,888, Dec. 4, 1987, abandoned. This application Mar. 30, 1990, Ser. No. 503,096
Claims priority, application Japan, Dec. 5, 1986, 62-291316
Int. Cl.[5] G01D *15/10*
U.S. Cl. 346—76 PH **9 Claims**



1. A thermal recorder for recording information on heat-sensitive paper comprising:

means for advancing heat-sensitive paper lengthwise through said recorder;

a linear array of heat-producing elements advanced across the paper in a direction perpendicular to the paper advancing direction;

reception means for receiving information signals, each of an amplitude value, generated for a plurality of sets of time intervals, each set being a predetermined number of time intervals and each time interval being of a predetermined length;

a plurality of storing means, each for storing first signals corresponding to the amplitude values of the information signals received during said plurality of sets of time intervals;

first switching means, alternately connecting each of said plurality of storing means with said reception means, for switching said connection of said reception means to a different one of said plurality of storing means after each said set of a predetermined number of time intervals;

digital to pulse-width conversion means for converting said first signals supplied from one of said plurality of storing means, into second signals of a predetermined pulse width in accordance with a predetermined relationship between the amplitude values of the received information signals and the pulse width of the record signals;

second switching means, alternately connecting each of said plurality of storing means with said digital to pulse-width conversion means, for switching said connection of said digital to pulse-width conversion means to a different one of said plurality of storing means after each said set of a predetermined number of time intervals, such that said reception means and said digital to pulse-width conversion means are continuously connected to a different of said plurality of storing means;

coupling means, connected to said digital to pulse-width conversion means, for coupling the resultant second signals of a predetermined pulse width to heat-producing elements of a terminal recording means;

said thermal recording means recording the received information signals, each of an amplitude value, with different degrees of darkness substantially in direct proportion to the amplitude values of the received information signals in response to said pulse-widths of said second signals; and

drive means for alternately moving the array of heat-producing elements during said recording by said thermal recording means and for then moving said heat sensitive

paper upon completion of said recording by said recording means.

5,005,028

IMAGE FORMING METHOD AND TRANSFER RECORDING MEDIUM THEREFOR

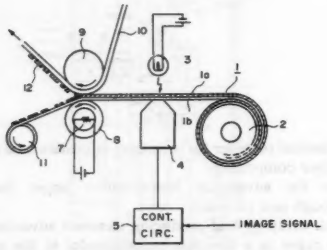
Yasuyuki Tamura, Yokohama, and Shuzo Kaneko, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 869,689, Jun. 2, 1986. This application Sep. 8, 1988, Ser. No. 242,022

Claims priority, application Japan, Jun. 3, 1985, 60-120080; Jun. 3, 1985, 60-120081; Jun. 17, 1985, 60-131411; Jun. 20, 1985, 60-134831; Jul. 9, 1985, 60-150597; Sep. 10, 1985, 60-199926; Nov. 11, 1985, 60-250884

Int. Cl.[5] G01D *15/10*

U.S. Cl. 346—76 R 19 Claims



1. An image forming apparatus for a method wherein a transferable portion is formed in a transfer recording layer of a transfer recording medium, transported in a predetermined direction and is then transferred to a transfer-receiving medium to form an image thereon, said apparatus comprising:

transferable portion-forming means for imparting heat and light energies so that at least one of the heat and light energies corresponds to an image signal, thereby forming the transferable portion, and

transfer means for transferring the transferable portion formed in said transfer recording layer; said transfer means being disposed downstream of the transfer portion-forming means with respect to the transporting direction of the transfer recording medium.

5,005,029

TRANSMITTING RADIATION THROUGH A FLEXIBLE PRINTED CIRCUIT TO AN OPTICAL FIBER BUNDLE

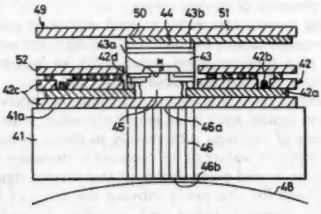
Masashi Fuse, Morioka, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 228,886, Aug. 4, 1988, Pat. No. 4,929,965. This application Apr. 13, 1990, Ser. No. 509,109

Claims priority, application Japan, Sep. 2, 1987, 62-220007; Sep. 2, 1987, 62-220008; Nov. 7, 1987, 62-281343; Nov. 7, 1987, 62-281344; Nov. 7, 1987, 62-281342; Nov. 7, 1987, 62-281345

Int. Cl.[5] G01D *9/42;* G02B *6/08;* H01L *33/00*

U.S. Cl. 346—107 R 2 Claims



1. An optical writing head comprising:

a light emitting means emitting radiation in a first direction;

at least one flexible printed circuit having formed thereon at least one pattern of electrode, said pattern facing a second direction opposite to said first direction;

a fiber plate supporting said at least one flexible printed circuit;

a plurality of optical fibers buried in said fiber plate such that one end of each optical fiber is positioned to receive such radiation, said radiation arriving from said light emitting means to said end of said optical fiber through the material of said at least one flexible printed circuit.

5,005,030

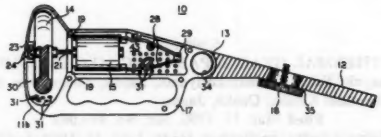
HAND HELD CAMERA STEADYING DEVICE

David L. Wells, 3881 Constitution Way, Boise, Id. 83706

Filed May 29, 1990, Ser. No. 529,322

Int. Cl.[5] G03B *17/00*

U.S. Cl. 354—82 7 Claims



1. A camera steadying device which comprises:

a housing;

attachment means for attaching said housing to a camera; and

inertia means housed by said housing for creating a moment of inertia to resist sudden movements of an attached camera.

5,005,031

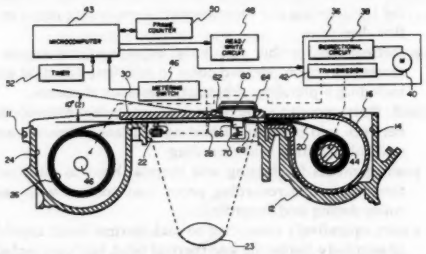
CAMERA APPARATUS FOR MAGNETICALLY RECORDING ON FILM

Richard R. Kelbe, Fishers, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 254,914, Oct. 7, 1988, abandoned. This application Jun. 25, 1990, Ser. No. 541,434

Int. Cl.[5] G03B *17/24*

U.S. Cl. 354—106 6 Claims



1. A photographic still camera for transporting a photographic film through an exposure position to expose frames of the film, the film having a magnetic surface for magnetically recording information on the film, said camera comprising:

a camera body having an exposure opening;

a film platen supported to engage the film and hold it in a exposure plane adjacent said opening; and

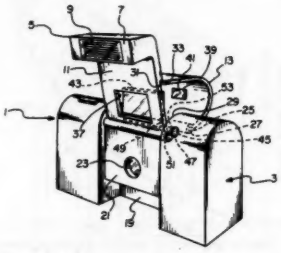
a magnetic head mounted on said platen to engage one side of the film, said magnetic head being inclined transversely of the film to approximate the film inclination resulting from film curl.

5,005,032

OPTICAL FINDER FOR CAMERA WITH FLIP-UP FLASH UNIT

William L. Burnham, Leroy, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 12, 1990, Ser. No. 479,006
Int. Cl.[5] G03B *13/06, 15/03*
U.S. Cl. 354—149.11 7 Claims



1. A photographic camera comprising (a) a camera housing and (b) a flip-up unit including a head part having a flash emission window and a supporting part for said head part connected to said camera housing to permit movement of said flash unit to a folded storage position in which the head part and said supporting part cover respective portions of the camera housing and to a non-folded operative position in which the head part and the supporting part are elevated from the camera housing with said flash emission window substantially facing a subject to be photographed, is characterized in that:

said supporting part of said flash unit has a viewfinder opening for viewing through said viewfinder opening a subject to be photographed when the flash unit is in its non-folded position;

a finder objective lens and a finder eyelens are supported for movement relative to said camera housing to individual viewing positions in which said finder lenses are optically aligned with and spaced behind said viewfiner opening of said supporting part when said flash unit is in its non-folded position, to permit a subject to be photographed to be viewed through the finder lenses in addition to through the viewfinder opening; and

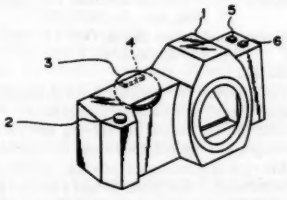
motion-transmitting means connects said supporting part and said finder lenses for moving the finder lenses to their viewing positions responsive to movement of said flash unit to its non-folded position.

5,005,033

PHOTOGRAPHING DATA SETTING APPARATUS FOR CAMERA

Tetsuo Miyasaka, Machida, Japan, assignor to Olympus Optical Company, Ltd., Tokyo, Japan

Filed Jul. 27, 1989, Ser. No. 386,580
Claims priority, application Japan, Aug. 1, 1988, 63-192555
Int. Cl.[5] G03B *17/00*
U.S. Cl. 354—289.1 25 Claims



1. A photographing data setting apparatus for a camera capable of setting a plurality of types of photographing data upon rotation of a single rotary member, comprising:

a rotary operation member exposed from a plurality of portions of said camera so as to be operable at each of said plurality of exposed portions;

detection means for detecting that said rotary operation member is operated at a predetermined one of said exposed portions;

pulse signal generation means for generating a pulse signal upon rotation of said rotary operation member; and

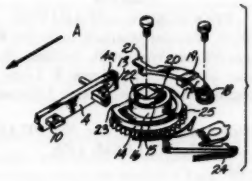
a photographing data setting circuit for setting predetermined photographing data according to a detection output from said detection means on the basis of a pulse output from said pulse signal generation means, thereby setting and storing the plurality of types of photographing data.

5,005,034

CAMERA MECHANISM

Yet Chan, Kowloon, Hong Kong, assignor to Achiever Industries, Ltd., Mongkok, Hong Kong

Filed Apr. 11, 1990, Ser. No. 508,118
Claims priority, application United Kingdom, Apr. 14, 1989, 8908514
Int. Cl.[5] G03B *17/42*
U.S. Cl. 354—204 5 Claims



1. A camera mechanism in which a shutter plate operating member is slidably mounted for movement between a cocked position and a rest position and biassed by biassing means into said rest position, and in which actuator means is provided for effecting said sliding movement of said shutter plate operating member, said actuator means being adapted to be connected to a film wind-on device of a camera, wherein said actuator means comprises a cam mounted for rotation in said mechanism and an abutment surface on said shutter plate operating member for cooperating with said cam, so that, in use, rotation of the cam causes said shutter plate operating member to move from its rest position to its cocked position against the urging of said biassing means, said cam being provided with force-varying means whereby greater force is needed to rotate the cam over an initial part of the cocking stroke of the shutter plate operating member than is needed for a final part of said cocking stroke.

5,005,035

CAMERA OPERATING MECHANISM

Daniel M. Pagano, Henriette, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 20, 1989, Ser. No. 439,217
Int. Cl.[5] G03B *17/42, 1/62, 1/00, 17/36*
U.S. Cl. 354—206 13 Claims

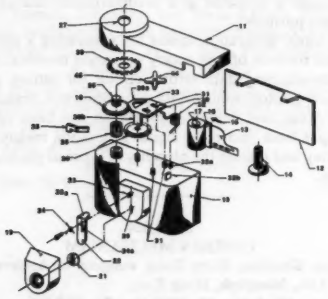
1. Operating mechanism for a camera having a shutter, actuation of which makes an exposure, comprising:

first gear wheel means mounted for axial and rotary movement, and carrying a shutter release button normally projecting outside the camera so as to be accessible to the camera user;

means biasing said first gear wheel means to urge said button to said projecting position;

a slide member carrying shutter actuating means and biased

for sliding, shutter actuating movement from a cocked position, an edge of said slide member being in contact with the periphery of said first gear wheel means when in cocked position, said slide member thereby being blocked against shutter actuating movement; and



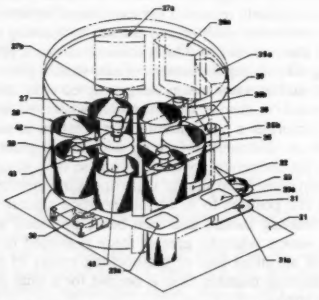
said first gear means being movable out of contact with said slide member by depression of said shutter release button, thereby releasing said slide member for shutter actuating movement.

5,005,036

PROCESSING APPARATUS

William B. Wilson, Hamlin; Matthew DiPietro, Webster; Richard K. Neace, Hilton; Vincent B. Dethier, Rochester; Raymond G. Hauss, Rochester, and James R. Louk, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 22, 1989, Ser. No. 397,147
Int. Cl.[5] G03B *3/08*
U.S. Cl. 354—322 **17 Claims**



1. Mechanism for effecting movement of film holder means in processing apparatus for photographic film said apparatus being of the type in which said film holder means is sequentially lowered into and raised out of a plurality of circularly arranged processing stations, comprising:

a rotatable upright column having a spiral groove and located centrally of said stations;

annular hub means slideably mounted on said column and having radially extending means for carrying said film holder means;

said hub means having pin means engaging said spiral groove to cause upward movement of said hub means along said column upon rotation of said column in a first direction and downward movement upon rotation of said column in a second direction; and

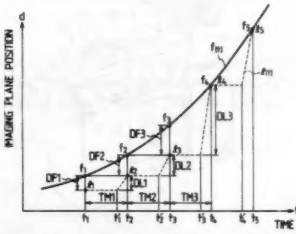
means securing said hub means against rotation with said column except when said hub means is at an upper portion of said column.

5,005,037

AUTO FOCUS ADJUSTING DEVICE

Akira Akashi; Terutake Kadohara, both of Yokohama; Ichiro Ohnuki, Kawasaki, and Masaki Higashihara, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 272,475, Nov. 17, 1988, abandoned. This application May 29, 1990, Ser. No. 528,908
Claims priority, application Japan, Nov. 20, 1987, 62-293576
Int. Cl.[5] G03B *13/36*
U.S. Cl. 354—400 **5 Claims**



1. Apparatus for use with an auto focus adjusting device which is provided with a focus state detecting circuit for detecting a focusing state of an imaging optical system and a driving circuit for driving the imaging optical system n conformity with a result of the detection by said detecting circuit, comprising:

(a) a calculation circuit for performing a first calculation in which imaging plane positions at a plurality of points of time in the past and at the present time are determined on the basis of a signal representing a focusing state in the past detected by said focus state detecting circuit and a signal representing a focusing state at the latest time to determine coefficients of a predetermined higher order function, and for performing a second calculation in which an imaging plane position at a time after a predetermined time has passed is determined on the basis of the higher order function:

(b) a regulation circuit for regulating the signal representing the focusing state detected by said focus detecting circuit, and for causing the operation of said calculation circuit to be performed on the basis of said regulated signal; and

(c) a control circuit for transmitting the signal representing the imaging plane position obtained by said calculation circuit to said driving circuit for driving said imaging optical system.

5,005,038

FOCAL LENGTH CHANGEABLE CAMERA

Yukio Ogawa, Kanagawa; Michio Hirohata; Takanori Kodaira, both of Tokyo, and Makoto Miyawaki, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

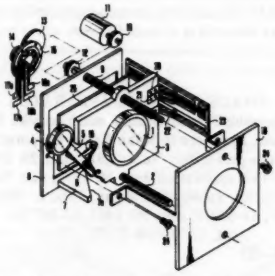
Continuation of Ser. No. 504,053, Apr. 2, 1990, abandoned, which is a continuation of Ser. No. 406,189, Sep. 12, 1989, abandoned, which is a continuation of Ser. No. 325,036, Mar. 14, 1989, abandoned, which is a continuation of Ser. No. 145,654, Jan. 13, 1988, abandoned, which is a continuation of Ser. No. 918,619, Oct. 10, 1986, abandoned, which is a continuation of Ser. No. 658,694, Oct. 9, 1984, abandoned. This application Jun. 27, 1990, Ser. No. 545,123
Claims priority, application Japan, Oct. 11, 1983, 58-188341
Int. Cl.[5] G03B *5/00, 13/32*
U.S. Cl. 354—400 **79 Claims**

1. A driving device for varying a focal length of photographic optical means of a camera, comprising:

(A) movable optical means for varying the focal length of the photographic optical means and for focusing the photographic optical means, said movable optical means being movable between a first position and a second position and arranged for performing the variation of the focal length

and the focusing while moving between the first position and the second position;

(B) single electric driving means for driving said movable optical means; and



(C) control means for controlling said electric driving means, said control means including switch means for actuating said electric driving means so as to restore said movable optical means to a predetermined position after photography is performed.

5,005,039

AUTOFOCUSING CAMERA

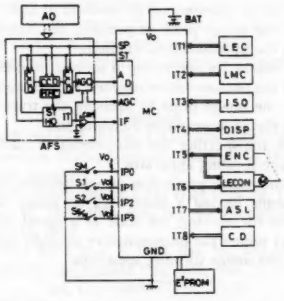
Masataka Hamada; Tokuji Ishida, and Kenji Ishibashi, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 16, 1989, Ser. No. 352,190

Claims priority, application Japan, May 17, 1988, 63-119690

Int. Cl.[5] G03B *13/00*

U.S. Cl. 354—402 **12 Claims**



1. A camera having an autofocusing mechanism, comprising:

foucus detecting means for repeatedly detecting a focusing state of an objective lens with respect to a photographic object and outputting a focus adjustment signal;

object detecting means for detecting movement of the object to be photographed in accordance with a plurality of said focus adjustment signals;

image magnification detecting means for detecting an image magnification rate;

a manually operable member;

release means for starting a shutter release operation in response to manual operation of said operable member and carrying out a subsequent photographic operation;

lens drive means capable of driving said objective lens during the shutter release operation when said object detecting means detects the movement of the photographic object; and

prohibiting means for prohibiting said lens drive means from driving said objective lens when said image magnification is greater than a predetermined rate.

5,005,040

AUTOMATIC FOCUS ADJUSTING APPARATUS OF A CAMERA

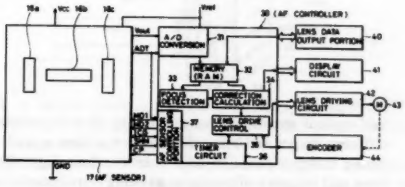
Toshio Norita; Tokuji Ishida; Masataka Hamada, and Kenji Ishibashi, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 352,824, May 16, 1989, abandoned. This application Feb. 14, 1990, Ser. No. 479,206

Claims priority, application Japan, May 16, 1988, 63-118682; May 16, 1988, 63-118683; Oct. 6, 1988, 63-252431; Oct. 6, 1988, 63-252432

Int. Cl.[5] G03B *13/36*; G02B *7/28*

U.S. Cl. 354—402 **14 Claims**



1. An automatic focus adjusting apparatus of a camera, comprising:

(a) a plurality of photoelectric converting means receiving light from an object, each of said photoelectric converting means having a plurality of light receiving portions and a plurality of charge accumulating portions for accumulating charges generated in said light receiving portions;

(b) accumulation controlling means for controlling time of charge accumulation in each said photoelectric converting means;

(c) focus detecting means for detecting an in-focus state of a photographic lens based on outputs from said photoelectric converting means to output a focus signal;

(d) calculating means for calculating an amount of driving said photographic lens based on said focus signal;

(e) selecting means for selecting one photoelectric converting means out of said plurality of photoelectric converting means, a focusing error being generated when said photographic lens is moved during said time of charge accumulation of the photoelectric converting means selected by said selecting means;

(f) correcting means for correcting the amount of driving of the photographic lens calculated based on said focusing error; and

(g) driving means for driving said photographic lens based on said corrected amount of driving the photographic lens.

5,005,041

FOCUS DETECTING APPARATUS HAVING A PLURALITY OF FOCUS DETECTING AREAS

Yasuo Suda; Keiji Ohtaka; Kenji Suzuki; Akira Ishizaki, and Keisuke Aoyama, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1988, Ser. No. 266,804

Claims priority, application Japan, Nov. 5, 1987, 62-279835; Nov. 5, 1987, 62-279836; Nov. 5, 1987, 62-279837

Int. Cl.[5] G03B *13/36*; G02B *7/34*

U.S. Cl. 354—407 **10 Claims**

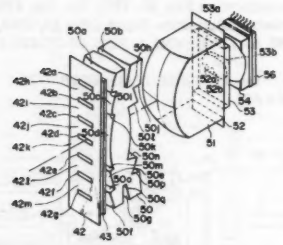
1. An apparatus for detecting the focus adjusted state of an objective lens, comprising:

a pair of light distribution forming lenses for forming a plurality of light distribution sets whose relative positions are displaced in conformity with the focus adjusted state of the objective lens, from a light beam passed through the objective lens;

sensing means provided with a plurality of arrangements of sensors for receiving said light distribution sets, and for

outputting a signal regarding the relative positions of said light distributions sets, said signal being indicative of the focus adjusted state of the objective lens; and

optical means for imparting the action of a field lens to a light beam incident on the arrangements of the sensors,



said optical means having a plurality of components of different shapes and being disposed on or near a predetermined imaging plane of said objective lens, light fluxes from said plurality of components being introduced to said pair of lenses.

5,005,042

ELECTRIC CONTROL CAMERA

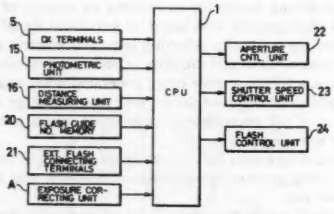
Osamu Sato, and Isamu Hirai, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 174,465, Mar. 28, 1988, abandoned. This application Jan. 25, 1990, Ser. No. 471,013

Claims priority, application Japan, Mar. 26, 1987, 62-72918

Int. Cl.[5] G03B *7/00*

U.S. Cl. 354—412 **8 Claims**



1. A camera having a built-in flash comprising:

(a) film sensitivity data input means (5) for inputting sensitivity data (SV) of a film inserted into said camera;

(b) shutter means settable in accordance with shutter speed values TV;

(c) diaphragm aperture means settable in accordance with aperture values AV;

(d) photometric means (15) for determining the brightness value BV of an object to be photographed by said camera;

(e) distance setting means for setting distance values DV of the object;

(f) data processing means (1) connected to said film sensitivity data input means (5) and to said photometric means (15) for calculating an exposure value EV in accordance with said film sensitivity data value SV and with said brightness value BV;

(g) said data processing means being operable for determining whether said exposure value EV is larger than a first predetermined value, and when said exposure value EV is larger than the first predetermined value, said data processing means varies the amount of light emitted by said flash according to said exposure value EV, flash photographing is carried out with a shutter speed at a first constant value, and an aperture value is calculated according to the following expression:

$$AV=AVs+(SV-SVs)-\alpha(DV-DVs)$$

wherein AVs, SVs and DVs are initially set values for the values AV, SV, and DV, respectively, when not yet available, and wherein α is a coefficient.

5,005,043

IMAGE FORMING APPARATUS

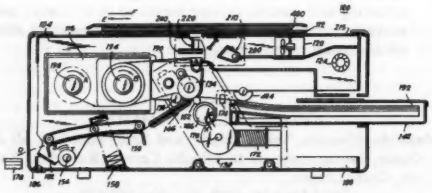
Atsushi Kobayashi; Takashi Suzuki, and Yasuhiko Kosugi, all of Suwa, Japan, assignors to Seiko Epson Corporation, Japan

Continuation-in-part of Ser. No. 149,815, Jan. 29, 1988, Pat. No. 4,860,058. This application Jun. 26, 1989, Ser. No. 371,226

Claims priority, application Japan, Feb. 2, 1987, 62-22006; Mar. 3, 1987, 62-48275; Apr. 30, 1987, 62-107702

Int. Cl.[5] G03B *27/32, 27/52*

U.S. Cl. 355—27 **21 Claims**



1. An image forming apparatus for forming an image on a transfer medium by pressing the transfer medium against a photosensitive medium having light sensitive microcapsules thereon, the apparatus comprising:

image projection means for subjecting a first predetermined region of the photosensitive medium to light representative of the image prior to pressing the transfer medium against the photosensitive medium;

exposure means for subjecting a second predetermined region of the photosensitive medium to light nonrepresentative of the image prior to pressing the transfer medium against the photosensitive medium; and

means for transporting the photosensitive medium within the image forming apparatus;

wherein the image projection means includes slide projection means having a slide with an image thereon and operable for moving the slide at a speed based on the speed at which the photosensitive medium is transported within the image forming apparatus.

5,005,044

AUTOMATIC MASKING DEVICE

Makoto Yahata, and Fumihiko Nishida, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Sep. 21, 1989, Ser. No. 410,201

Claims priority, application Japan, Oct. 14, 1988, 63-260295

Int. Cl.[5] G03B *27/52*

U.S. Cl. 355—40 **13 Claims**

1. A masking device for covering, when an image of an original is to be exposed on a photosensitive material, an area which is not to be exposed of said photosensitive material, comprising:

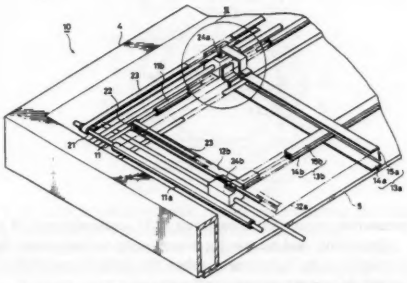
a light transmitting plate having a pair of end portions in a first direction and a pair of end portions in a second direction intersecting said first direction provided on said original;

a pair of first light intercepting means, each said first light intercepting means having one end thereof fixed near an end portion of said first direction of said plate for covering said plate from both sides in said first direction,

each one of said first light intercepting means including a first cover for covering said plate and means for determining an end portion of said first cover in the first direction,

each of said means for determining an end portion in the first direction including a first cover holding means for holding said end portion of the corresponding first cover, and means for defining an opening portion in the first direction arranged close to said plate,

a first space existing between said first cover holding means and the associated means for defining an opening portion in said first direction; and



a pair of second light intercepting means, each of said second light intercepting means having one end fixed near an end portion thereof in said direction of said plate, for covering said plate from both sides in said second direction,

each one of said second light intercepting means including a second cover for covering said plate and means for defining an end portion of said second cover in said second direction, said means for defining an end portion in the second direction including a second cover holding means for holding said end portion of said cover and means for defining an opening portion in the second direction,

at least part of said means for defining an end portion in the second direction being near said means for defining an opening portion in said first direction located in said first space.

5,005,045

REPROGRAPHIC CAMERA SYSTEM

Knud S. Stovring, Holte, Denmark, assignor to Helioprint Als, Kvistgaard, Denmark

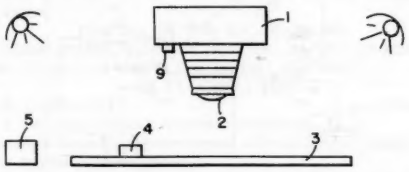
PCT No. PCT/DK88/00178, § 371 Date Mar. 20, 1990, § 102(e) Date Mar. 20, 1990, PCT Pub. No. WO89/04506, PCT Pub. Date May 18, 1989

PCT Filed Nov. 2, 1988, Ser. No. 469,547

Claims priority, application Denmark, Nov. 3, 1987, 5759/87

Int. Cl.[5] G03B *27/74, 27/80*

U.S. Cl. 355—68 **8 Claims**



1. A reprographic camera system comprising; a reprographic camera (1) with a vertical optical axis and a mainly horizontal, original table (3) positioned under the objective lens (2) of the camera, an arrangement separate from the camera for the transfer of signals of density and/or picture data to an exposure sure control device in the camera, wherein, the reprographic camera (1) and said device include transducer means (6, 7, 8) for wireless transfer of signals from said arrangement to the exposure control means.

5,005,046

PATTERN FORMING METHOD

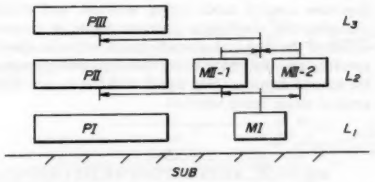
Koichi Hashimoto, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 20, 1990, Ser. No. 496,010

Claims priority, application Japan, Mar. 20, 1989, 1-68306

Int. Cl.[5] G03B *27/42*

U.S. Cl. 355—77 **15 Claims**



1. A pattern forming method comprising the steps of:

forming a first layer which includes a first alignment mark on a substrate;

forming a second layer which includes a first pattern and second and third alignment marks on said first layer, said second and third alignment marks being independently aligned with said first alignment mark;

measuring the positions of said second and third alignment marks and calculating the deviations of said positions from predetermined design positions;

moving the substrate to a correct location determined from the calculated deviations; and

forming a third layer which includes a second pattern on said second layer by aligning said second pattern with said second and third alignment marks.

5,005,047

CAMERA DATA SETTING DEVICE

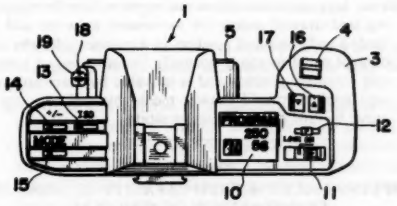
Akihiko Fujino, Osaka; Manabu Inoue, Kobe; Takanobu Omaki, Osaka; Masaaki Nakai, Osaka; Akira Fujii, Osaka, and Minoru Sekida, Osaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 388,316, Aug. 1, 1989, abandoned, which is a continuation of Ser. No. 115,620, Oct. 30, 1987, abandoned, which is a continuation of Ser. No. 807,694, Dec. 11, 1985, abandoned. This application Mar. 7, 1990, Ser. No. 489,881

Claims priority, application Japan, Dec. 14, 1984, 59-190602[U]; Dec. 14, 1984, 59-190603[U]; Dec. 17, 1984, 59-191074[U]

Int. Cl.[5] G03B *17/18, 7/097*

U.S. Cl. 354—442 **11 Claims**



1. A camera data setting device for use in a camera which is operable selectively in a diaphragm aperture priority automatic exposure control mode, an exposure time priority automatic exposure control mode and a manual exposure control mode, said device comprising:

first and second manual means located at different positions on the camera and manually operable for generating first and second data changing signals, respectively;

selection means for selecting an exposure control mode from said diaphragm aperture priority, exposure time priority and manual exposure control modes; and

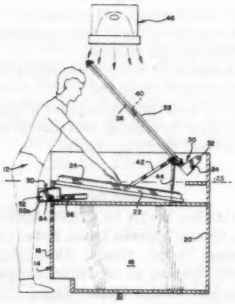
a data changing means for changing the diaphragm aperture value and the exposure time value in response to the data changing signals, said data changing means including means for changing the exposure time value in response to either of said first and second data changing signals with the exposure time priority mode being selected, and in response to said first data changing signal with the manual exposure control mode being selected, and means for changing the diaphragm aperture value in response to either of the first and second signals with the diaphragm aperture priority mode being selected, and in response to the second data changing signal with the manual exposure control mode being selected.

5,005,048

GRAPHIC ARTS EXPOSURE DEVICE

Charles J. Leonhart, Schaumburg, Ill., assignor to nuArc Company, Inc., Niles, Ill.

Filed Jul. 5, 1990, Ser. No. 548,086
Int. Cl.[5] G03B *27/20*
U.S. Cl. 355—93 **20 Claims**



1. A graphic arts exposure device, including:

means defining a work surface at a convenient working level and having a forward edge facing a standing operator using the device;

drawer means below said working level movable between an extended position outwardly of said forward edge and a retracted position;

control panel means for controlling the operation of said device mounted with said drawer means and facing upwardly in the same field of view as said working surface; and

drawer support means below said work surface for supporting said drawer means for movement between said extended and retracted position in a manner whereby said control panel means is normally biased to move toward said extended position and is movable by rearward pressure applied to said drawer means by said operator to move toward said retracted position.

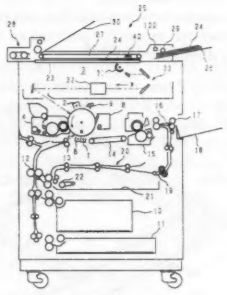
5,005,049

COPYING MACHINE WITH CAPACITY TO MEASURE TRANSPARENCY OF ORIGINAL

Kouji Matsushita, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 17, 1989, Ser. No. 395,438
Claims priority, application Japan, Aug. 18, 1988, 63-205205
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—208 **19 Claims**

1. A copying machine irradiating light to a document from an exposure light source, guiding the reflected light from said document to a photosensitive body so as to form latent images corresponding to images of said document, supplying toner from a developing unit so as to develop said latent images, and transferring said developed images onto a copying paper, comprising:



measuring means for measuring light transmittance of said document, said measuring means using said exposure light source as its light source when the light transmittance of said document is measured; and

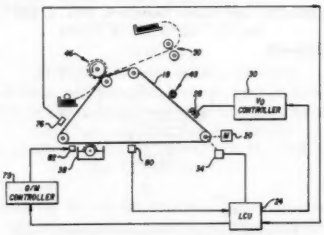
adjusting means for adjusting a copying condition corresponding to said light transmittance measured by said measuring means.

5,005,050

CONTROL OF TONER PARTICLE CHARGE

Lawrence J. Donivan, and Joseph F. Laukaitis, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 15, 1989, Ser. No. 366,728
Int. Cl.[5] G03G *15/08*
U.S. Cl. 355—208 **6 Claims**



1. In an electrostatographic reproduction machine having means for developing an electrostatic latent image with charged toner particles, the improvement comprising:

means for producing a control signal characteristic of the ratio of toner particle electrostatic charge to the toner particle mass; and

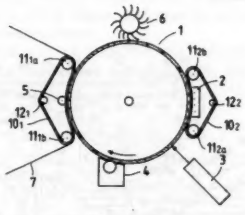
means responsive to said control signal for adjusting said ratio, said adjusting means including a source of ions and means for directing the ions to the toner particles.

5,005,051

ELECTROPHOTOGRAPHIC IMAGE RECORDING APPARATUS USING AMORPHOUS SILICON HYDRIDE PHOTOSENSITIVE DRUM

Shinichi Haruki; Yhuzi Furuya, and Akio Tsujita, all of Katsuta, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1990, Ser. No. 498,518
Claims priority, application Japan, Mar. 24, 1989, 1-73002
Int. Cl.[5] G03G *15/02, 5/16, 21/00*
U.S. Cl. 355—221 13 Claims



1. An electrophotographic recording apparatus for recording an image on a recording medium comprising:

a photosensitive member rotatable about its own axis and having a peripheral surface made of amorphous silicon hydride, said photosensitive member being movable in a predetermined direction and at a predetermined speed at the time of image recording;

charging means for uniformly charging said photosensitive member, said charging means comprising a corona discharger;

exposure means for exposing said uniformly charged photosensitive member to light to form a latent image thereon;

developing means for developing the latent image and providing a visible image on said photosensitive member;

transfer means for transferring the visible image onto the recording medium, said transfer means comprising a corona discharger, the recording medium being transported between said transfer means and said photosensitive member while contacting the surface of said photosensitive member; and

shielding means provided in association with at least one of said corona dischargers or shielding said corona discharger to interrupt atmospheric contact with the surface of said photosensitive member, said shielding means comprising a hermetically sealed unit for confining at least one of said charging and transfer units therein.

5,005,052

IMAGE FORMING APPARATUS HAVING VERTICALLY MOVABLE ORIGINAL COVER

Junji Watanabe, Yokohama, and Yuji Ishikawa, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

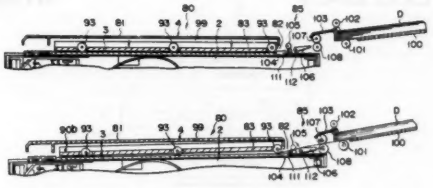
Filed Dec. 20, 1988, Ser. No. 286,885
Claims priority, application Japan, Dec. 24, 1987, 62-325356; Dec. 24, 1987, 62-325358; Dec. 28, 1987, 62-330067
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—231 2 Claims

1. An image forming apparatus comprising:

a main body having an original table surface on which an original is to be placed;

scanning means, arranged inside said main body, for scanning he original placed on said original table surface; and

an automatic original feeder including an original cover arranged above the original table surface to be movable between a lower position where said original cover is in contact with said original table surface, to press the original toward said original table surface, and an upper position where said original cover is away from said original table surface, said original cover having one end portion which is located at a downstream side of the feeding direction of the original and being rotatable between said upper and lower positions about said one end portion, feeding means for feeding the original to said original table surface, original cover drive means for moving said original cover to the upper position when the original is to



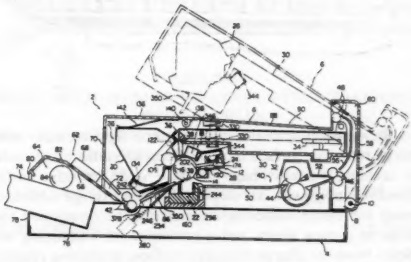
be fed onto said original table surface, a feed roller arranged to contact said original table surface, and roller drive means for driving said feed roller to feed the original, fed by said feeding means, to a predetermined position on said original table surface.

5,005,053

IMAGE-FORMING MACHINE HAVING A PROCESS ASSEMBLY COMPRISING TWO INDEPENDENTLY MOVABLE UNITS

Nobuhiko Kozuka, Suita, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Feb. 6, 1990, Ser. No. 475,826
Claims priority, application Japan, Feb. 15, 1989, 1-33660
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—245 18 Claims



2. An image-forming machine comprising a main body and a process unit to be mounted detachably on the main body, wherein

the process unit includes an image-bearing means having an electrostatographic material and a transfer corona discharger for transferring the toner image formed on the surface of the electrostatographic material to a sheet material, a transfer zone existing between the image-bearing means and the transfer corona discharger,

an introduction opening for introducing a sheet material into the transfer zone is formed in one surface of the process unit, and a withdrawing opening for withdrawing the sheet material conveyed through the transfer zone is formed in the other surface of the process unit, and

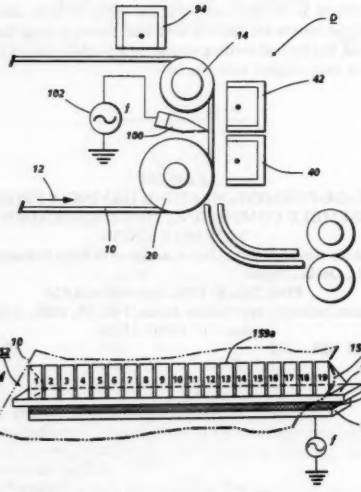
an opening-closing cover for opening or closing the opening is provided in at least one of the introduction opening and the withdrawing opening.

5,005,054

FREQUENCY SWEEPING EXCITATION OF HIGH FREQUENCY VIBRATORY ENERGY PRODUCING DEVICES FOR ELECTROPHOTOGRAPHIC IMAGING

Ronald E. Stokes, Fairport; William J. Nowak, Webster; Anthony A. Attardi, Rochester, and Daniel W. Costanza, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 2, 1990, Ser. No. 548,645
Int. Cl.[5] G03G *15/14, 21/00;* H02N *1/04*
U.S. Cl. 355—273 14 Claims



1. In an imaging device having a non-rigid member with a charge retentive surface moving along an endless path, means for creating a latent image on the charge retentive surface, means for imagewise developing the latent image with toner, means for electrostatically transferring the developed toner image to a copy sheet, and a resonator for enhancing toner release from the charge retentive surface, producing relatively high frequency vibratory energy and having a portion thereof adapted for contact across the flexible belt member, generally transverse to the direction of movement thereof, the resonator comprising:

a horn member for applying the high frequency vibratory energy to the non-rigid member, having a platform portion, a horn portion, and a contacting portion

said horn member divided into a linear array of horn segments across said belt member, each horn segment including horn portion and contacting portion;

vibratory energy producing means coupled to said horn platform for generating the high frequency vibratory energy required to drive said horn member; and

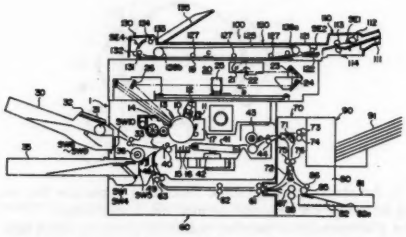
a voltage source for driving said vibratory energy producing means through a range of frequency responses, said range of frequency responses including resonant frequencies of each horn segment.

5,005,055

COPYING APPARATUS PROVIDED WITH AUTOMATIC DOCUMENT FEEDER

Hirokazu Matsuo, and Hiroyasu Nagato, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 188,555, Apr. 29, 1988, abandoned.
This application Oct. 27, 1989, Ser. No. 428,026
Claims priority, application Japan, May 1, 1987, 62-108624; May 18, 1987, 62-121647; May 18, 1987, 62-121648; May 18, 1987, 62-121649; May 18, 1987, 62-121650
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—311 25 Claims



1. A copying apparatus comprising:

transporting means for sequentially feeding a pair of original documents and serially placing them onto a platen in the document feeding direction, said transporting means including detect means for detecting the sizes of the documents fed by said transporting means;

illuminating means for illuminating the pair of original documents on the platen;

image forming means for copying the images of the documents which were serially placed on said platen and illuminated by said illuminating means to a copy sheet; and

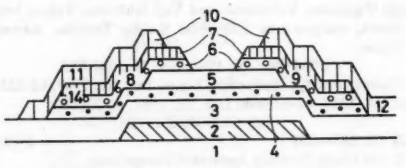
inhibition means for inhibiting the illuminating operation as well as the image forming operation when the sizes of the pair of documents are different.

5,005,056

AMORPHOUS-SILICON THIN FILM TRANSISTOR ARRAY SUBSTRATE

Noboru Motai, Tochigi; Sakae Tanaka, and Yoshiaki Watanabe, both of Tokyo, all of Japan, assignors to Nippon Precision Circuits Ltd. and Seikosha Co., Ltd., both of Tokyo, Japan

Filed Feb. 3, 1989, Ser. No. 306,373
Claims priority, application Japan, Feb. 26, 1988, 63-43577
Int. Cl.[5] H01L *45/00*
U.S. Cl. 357—2 7 Claims



1. In a reverse staggered type amorphous-silicon thin film transistor array substrate including amorphous silicon thin film transistors provided in an array, gate electrodes, gate wirings interconnecting the gate electrodes of said amorphous silicon thin film transistors, source electrodes comprised at least of an impurity doped silicon layer, and first source wirings composed of a transparent conductive layer interconnecting the source electrodes of said transistors, the improvement wherein said amorphous silicon thin film transistor array substrate comprises an auxiliary source wiring extending under said first

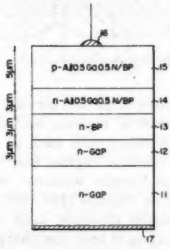
source wirings and interconnecting said source electrodes, said auxiliary wiring being formed with said source electrodes, whereby said auxiliary wirings are composed of the same material as the source electrode of at least one of said amorphous silicon thin film transistors.

5,005,057

SEMICONDUCTOR LIGHT-EMITTING DIODE AND METHOD OF MANUFACTURING THE SAME

Toshihide Izumiya, Tokyo; Yasuo Ohba, Yokohama, and Ako Hatano, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 13, 1990, Ser. No. 508,685
Claims priority, application Japan, Apr. 28, 1989, 1-110503
Int. Cl.[5] H01L *33/00, 27/12, 49/02, 45/00*
U.S. Cl. 357—17 13 Claims



1. A semiconductor light-emitting diode including a light-emitting layer with a p-n junction, said light-emitting layer comprising:

a first superlattice layer, of a first conductivity type, wherein a plurality of BP and $Ga_xAl_{1-x}N$ ($0 \leqq x \leqq 1$) layers are alternately stacked, said $Ga_xAl_{1-x}N$ ($0 \leqq x \leqq 1$) layers having a zinc blend type crystal structure; and

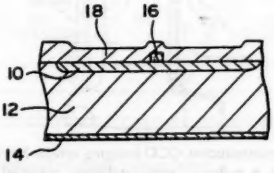
a second superlattice layer, of a second conductivity type, wherein a plurality of BP and $Ga_xAl_{1-x}N$ ($0 \leqq x \leqq 1$) layers are alternately stacked, said $Ga_xAl_{1-x}N$ ($0 \leqq x \leqq 1$) layers having a zinc blend type crystal structure.

5,005,058

LIGHT-EMITTING DIODE WITH LIGHT-TRANSMISSIVE FILM

Yukio Tanaka, Yokohama, Japan, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 4, 1990, Ser. No. 576,890
Claims priority, application Japan, Mar. 19, 1990, 2-69197
Int. Cl.[5] H01L *33/00*
U.S. Cl. 357—17 5 Claims



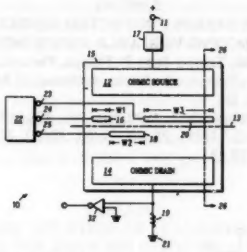
1. A light-emitting diode comprised of a light-emitting section constituted by a P-N junction and a thin film formed adjacent to the light-emitting section and through which light produced in the light-emitting section is transmitted to the outside, the thin film being formed of a material wherein the transmittivity of the thin film increases as the wavelength of the emitted light increases.

5,005,059

DIGITAL-TO-ANALOG CONVERTING FIELD EFFECT DEVICE AND CIRCUITRY

John M. Golio, and Joseph Staudinger, both of Chandler, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 1, 1989, Ser. No. 345,746
Int. Cl.[5] H01L *29/80, 29/78;* H03K *3/01*
U.S. Cl. 357—22 18 Claims



1. A field effect device suitable for providing an analog output signal having a magnitude which is representative of a digital input code having a sequence of bits, the field effect device including in combination:

an input electrode;

an output electrode;

a plurality of gate electrodes located between said input electrode and said output electrode, said gate electrodes providing different gate widths, each of said gate widths being representative of the magnitude of the analog signal to be provided at said output electrode in response to a digital input signal of a particular logic state to be applied to said gate electrode;

means for applying selected digital bits separately to each of said gate electrodes to independently control each of said gate electrodes; and

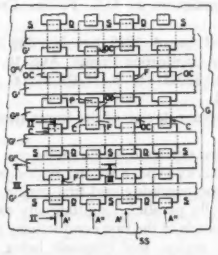
the magnitude of the current conducted between said input electrode and said output electrode thereby being adapted to be responsive to the total of the widths of the gates receiving said digital signal of said particular logic state.

5,005,060

TABLECLOTH MEMORY MATRIX WITH STAGGERED EPROM CELLS

Stefano Mazzali, Milan, Italy, assignor to SGS-Thomson Microelectronics s.r.l., Milan, Italy

Filed Mar. 21, 1989, Ser. No. 326,809
Claims priority, application Italy, Apr. 12, 1988, 20169 A/88
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.5 2 Claims



1. Memory matrix with EPROM cells comprising parallel and alternating source and drain lines, floating gate areas placed between said source and drain lines and control gate lines parallel with each other and perpendicular to said source

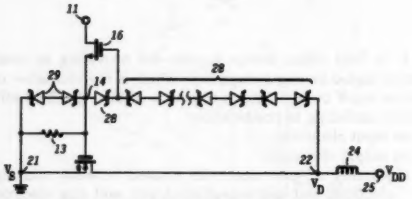
and drain lines superimposed on said floating gate areas, wherein said floating gate areas are arranged in rows parallel to said source and drain lines in positions longitudinally staggered in relation to those of an adjacent row in such a manner that the floating gate areas of a row underlie a first plurality of said control gate lines and the floating gate areas of the adjacent row underlie a second plurality of said control gate lines alternating with the first plurality of said control gate lines.

5,005,061

AVALANCHE STRESS PROTECTED SEMICONDUCTOR DEVICE HAVING VARIABLE INPUT IMPEDANCE

Stephen P. Robb, Tempe; John P. Phipps, Phoenix, and Michael D. Gadberry, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 5, 1990, Ser. No. 474,889
Int. Cl.[5] H01L *29/80, 29/06, 29/10, 27/02*
U.S. Cl. 357—23.13 **3 Claims**



1. A monolithic junction field effect transistor (JFET) comprising: a semiconductor substrate; an insulating layer disposed on the substrate; a polysilicon layer disposed on the insulating layer; and a JFET having a gate, drain, source, and channel formed in the polysilicon layer, wherein the JFET source, drain, and channel are of a first conductivity type and the JFET gate comprises a plurality of interconnected regions of a second conductivity type; at least one diode having an anode coupled to the gate of the JFET and a cathode coupled to a source of the JFET; and a power MOSFET transistor integrated with the JFET, wherein the power MOSFET transistor has a gate formed in the polysilicon layer, a drain formed in the substrate, and a source formed in the substrate, wherein the source of the JFET is coupled to the gate of the power MOSFET transistor, the drain of the JFET serves as a gate terminal for the power MOSFET transistor, and the gate of the JFET is coupled to the drain of the power MOSFET transistor, so that drain-to-source resistance of the JFET is controlled by the drain voltage of the power MOSFET transistor.

5,005,062

IMAGE SENSOR DEVICE OF THE FRAME TRANSFER TYPE

Jacobus G. C. Bakker, and Marnix G. Collet, both of Eirdhaven Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

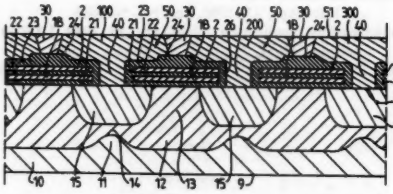
Filed Aug. 4, 1989, Ser. No. 389,726
Claims priority, application France, Aug. 10, 1988, 88 10786
Int. Cl.[5] H01L *29/78, 27/01, 29/00, 27/14*
U.S. Cl. 357—24 **20 Claims**

1. An image sensor device of the frame transfer type, comprising:

a semiconductor substrate which includes a first region of a first conductivity type, a second region of a second conductivity type overlying said first region, and a plurality of substantially parallel, longitudinally extending charge transfer channels of the first conductivity type arranged in said second region, said channels being aligned with a desired direction of charge transfer; and

an arrangement of charge transfer electrodes overlying a surface of said second region, which electrodes serve to transfer electrical charges of a first type along said substantially parallel channels when suitable voltages are applied thereto, Characterized In That

said device further comprises a network of electrically insulating separation strips **(24)** which overlie said arrangement of charge transfer electrodes **(1A, 1B, 1C, 1D)**, a photosensitive structure **(50)** which overlies both said separation strips and said second region, said structure **(50)** including conductive strips **(30)** of the second conductivity type which overlies said separation strips **(24)**, said separation strips **(24)** serving to outline a plurality of window regions **(100, 101, 200, 201)** in said structure **(50)**



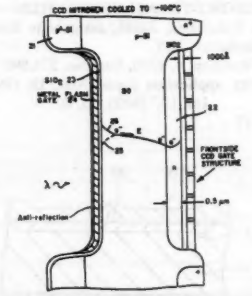
and said conductive strips **(30)** serving to at least partially separate said window regions, said device including a plurality of elementary cells each of which includes at least one such window region, said structure **(50)** also including charge transfer windows **(40, 240)** extending from said window regions **(100, 101, 200, 201)** to said substantially parallel channels, each elementary cell of said device including at least one charge transfer window to provide an electrical connection between the corresponding window region of the elementary cell and a charge transfer channel.

5,005,063

CCD IMAGING SENSOR WITH FLASHED BACKSIDE METAL FILM

James R. Janesick, La Canada, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Continuation of Ser. No. 197,564, May 23, 1988, abandoned, which is a division of Ser. No. 835,535, May 3, 1986, Pat. No. 4,760,031. This application Jan. 16, 1990, Ser. No. 466,070
Int. Cl.[5] H01L *29/78, 27/14, 29/06*
U.S. Cl. 357—24 **18 Claims**



14. In a semiconductor CCD imaging sensor having a buried n channel in a p-doped semiconductor material epitaxially grown over a p^+ doped substrate material, and having a gate structure over said buried n channel for control of storage and transfer of electrons, and further having a portion of said substrate material and a portion of p-doped semiconductor material removed to provide a thinned backside opposite said n channel, and a thin oxide film over said thinned backside, an improvement comprised of a thin transparent film of metal

over said thin oxide film, said metal having a work function higher than the work function of said p^+ doped substrate material for improvement and stabilization of the quantum efficiency of said CCD imaging sensor.

5,005,064

DEVICE FOR DETECTING MAGNETISM

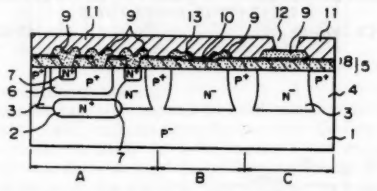
Yoshimi Yoshino, Inuyama; Kenichi Ao, Obu; Ichiro Izawa, Anjo, and Toshikazu Arasuna, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 18, 1988, Ser. No. 233,431

Claims priority, application Japan, Aug. 21, 1987, 62-208832; Apr. 30, 1988, 63-108518

Int. Cl.[5] H01L *27/22, 29/82, 29/96, 43/00*

U.S. Cl. 357—27 **13 Claims**



1. A device for detecting magnetism which comprises,

a substrate,

an interposed insulating layer having an impurity layer formed on an upper portion of said interposed insulating layer and an opening formed in said impurity layer, by removing a part of said impurity layer, said impurity layer formed on said substrate and containing impurities at a higher concentration than impurities in a remaining part of said interposed layer therein, and

a ferromagnetic magnetoresistive element formed at said opening on said interposed layer, thereby formed on an area with a smaller impurity concentration,

wherein at least a portion of said interposed layer on which said ferromagnetic magnetoresistive element is formed has a concentration of impurities less than a concentration of impurities in said impurity layer.

5,005,065

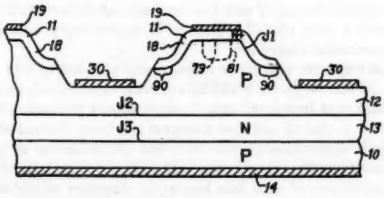
HIGH CURRENT GATE TURN-OFF THYRISTOR

Dante E. Piccone, Glenmoore, Pa.; James E. McIntyre, deceased, late of Crum Lynn, Pa. (by Anna M. McIntyre, executrix), and Leroy B. Major, West Chester, Pa., assignors to General Electric Company, King of Prussia, Pa.

Filed Apr. 6, 1989, Ser. No. 334,131

Int. Cl.[5] H01L *29/74, 29/747*

U.S. Cl. 357—38 **27 Claims**



1. A gate turn-off thyristor comprising:

(a) a multi-layer semiconductor body having at least four layers, with contiguous layers being of different P and N conductivity types and with at least three back-to-back PN junctions between contiguous layers; one end layer constituting an anode layer, an opposite end layer constituting a cathode layer, and an intermediate layer contiguous with said cathode layer constituting a gate layer; said gate layer having a predetermined surface region adjacent said cathode layer but uncovered by said cathode layer and extending alongside the PN junction between said cathode layer and said gate layer;

(b) an anode electrode in ohmic contact with said anode layer,

(c) an elongated cathode electrode in ohmic contact with said cathode layer, and

(d) a gate electrode in ohmic contact with said gate layer in said predetermined surface region of said gate layer, said gate electrode extending alongside said elongated cathode electrode but spaced from said cathode electrode about the entire periphery of said cathode electrode, and in which:

(e) the PN junction between said cathode layer and said gate layer has a region located centrally of said cathode electrode that is characterized by an avalanche voltage at least 4 volts lower than characterizes the region of said latter PN junction that is closest to said gate electrode.

5,005,066

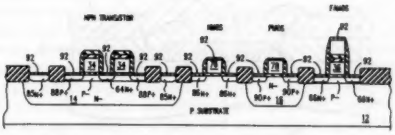
SELF-ALIGNED NPN BIPOLAR TRANSISTOR BUILT IN A DOUBLE POLYSILICON CMOS TECHNOLOGY

Kueing-Long Chen, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 184,737, Apr. 22, 1988, abandoned, which is a division of Ser. No. 57,586, Jun. 2, 1987, Pat. No. 4,784,966. This application Dec. 28, 1989, Ser. No. 455,769

Int. Cl.[5] H01L *27/02*

U.S. Cl. 357—43 **10 Claims**



1. A semiconductor device having a floating gate avalanche metal oxide semiconductor (FAMOS) structure, an NPN bipolar transistor, an N-channel field effect transistor (NMOS) and a P-channel field effect transistor (PMOS) in a substrate, comprising:

N-type material reservoirs formed in areas of P type material in said substrate, said reservoirs of N type material corresponding to sites of the PMOS and NPN structures;

regions of P type material formed in said substrate, at least one of said regions of P type material formed to serve as a threshold voltage adjust implant of the FAMOS structure, and at least one portion of said regions of P type material formed in said N type material reservoir of said NPN transistor to serve as a base layer for the NPN transistor;

a layer of oxide for gates of the MOS transistors;

regions of a first polysilicon layer formed on regions of said substrate, at least one of said regions of the first polysilicon layer aligned over a portion of said base layer of P type material of the NPN transistor and at least one portion of said regions of the first polysilicon layer being formed to align with said threshold voltage adjust implant region at the site of the FAMOS structure;

an interlayer oxide layer formed on the regions of said first polysilicon layer;

a second layer of polysilicon material formed over portions of the substrate;

the first layer of polysilicon material having an emitter hole therethrough, thereby exposing the site of the emitter of the NPN transistor, and regions of the first and second layers of polysilicon material forming the stack gate structure of the FAMOS structure, the sites of a source and drain of the FAMOS structure being adjacent said regions forming the stack gate structure;

N type material implanted into said sites of the source and drain of the FAMOS structure, and N type material implanted into said site of said emitter of said NPN transistor, the emitter being self-aligned by the first polysilicon layer;

gates for the NMOS and PMOS structures formed from portions of said second layer of polysilicon material;

N type material implanted into regions on the body to form a collector region of the NPN transistor and a source region and drain region of the NMOS structure; and

P type material implanted in a region of the base layer to form a P type doped base region(s) of the NPN transistor and a source region and drain region of the PMOS structure, the base region of the NPN transistor being self-aligned with said region of first polysilicon material aligned over said base layer, the doped base region being space apart from the emitter region, and having inner edges aligned with the region of the first polysilicon layer aligned over a portion of said base layer of P type material of the NPN transistor.

5,005,067

SEMICONDUCTOR INTEGRATED CIRCUIT

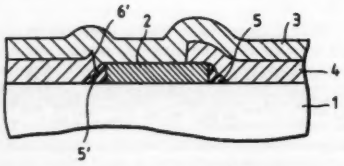
Yasushi Sakata, and Toshimichi Iwamori, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1988, Ser. No. 165,039

Claims priority, application Japan, Mar. 12, 1987, 62-57779

Int. Cl.[5] H01L *29/34, 23/02, 23/12*

U.S. Cl. 357—54 **5 Claims**



1. A semiconductor integrated circuit comprising:

a substrate;

a first electrically conductive wiring layer formed on a surface of the substrate, said first wiring layer being substantially rectangular in cross section with an upper surface having a laterally extending dimension defining the width dimension and opposite sidewalls defining the height dimension;

a first interlaid electrically insulating layer having a first etching speed overlaying at least a portion of the substrate on opposite sides of the first wiring layer, and being contiguous to both sidewalls of the first wiring layer, said first insulating layer longitudinally extending outwardly from the sidewalls of the first wiring layer in a direction substantially parallel with the width dimension of the first electrically conductive wiring layer defining a maximum width dimension contiguous to the substrate and having a maximum thickness dimension corresponding to the defined height dimension of said first wiring layer, said thickness dimension varying as a function of said width dimension;

a second interlaid electrically insulating layer having a second etching speed different than the first etching speed overlaying at least a portion of the first insulating layer on each side of the opposite sidewalls of the first wiring layer, said second insulating layer having opposing edges spaced from each other, said spaced opposing edges defining boundaries for an opening for exposing at least a portion of the upper surface of the first wiring layer through said opening; and

a second electrically conductive wiring layer overlaying said second insulating layer and filling said opening of the second insulating layer for making electrical contact with the first wiring layer, at least a portion of the first insulating layer protecting the substrate from electrical contact with the second wiring layer at times when at least one of the spaced opposing edges of the second insulating layer is spaced from the upper surface of the first wiring layer, wherein said first interlaid insulating layer includes a silicon nitride film.

5,005,068

SEMICONDUCTOR MEMORY DEVICE

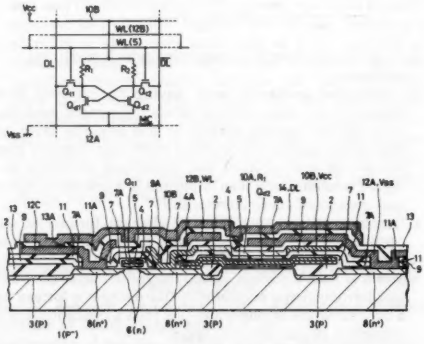
Shuji Ikeda, Koganei; Katsuro Sasaki, Fuchuu; Kouichi Nagasawa, Kunitachi, and Satoshi Meguro, Nishitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 5,950, Jan. 22, 1987, abandoned. This application Jul. 7, 1989, Ser. No. 376,953

Claims priority, application Japan, Jan. 22, 1986, 61-10077

Int. Cl.[5] H01L *29/040, 27/020*

U.S. Cl. 357—59 **45 Claims**



1. A semiconductor memory device comprising:

data lines which extend in a column direction over a semiconductor substrate and which are constituted as individual sets of complementary data lines, each set including a pair of complementary data lines and each data line of a corresponding pair of complementary data lines being coupled to an identical memory cell;

a plurality of memory cells each of which comprises cross-coupled first and second driver MISFETs and first and second switching MISFETs, each one of said first and second switching MISFETs being coupled between a respective one of said first and second driver MISFETs and a data line of a pair of complementary data lines associated therewith;

load elements which are respectively coupled to said first and second driver MISFETs of each memory cell, each of said data lines extending in substantially the same direction as that of said load elements and being formed above said semiconductor substrate and positioned so as to be substantially aligned over said load elements such that a projection of each data line in the direction of said semiconductor substrate would fall on a load element associated therewith; and

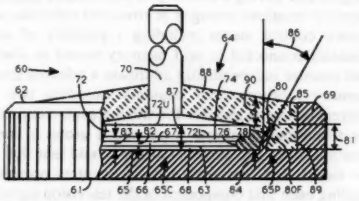
wirings for supplying a ground potential to said plurality of memory cells, said wirings being disposed as a wiring layer between said load elements of each one of said plurality of memory cells and each pair of data lines respectively associated therewith and being formed so as to cover said load elements.

5,005,069

RECTIFIER AND METHOD

William D. Wasmer, Fountain Hills; Peter J. Gillespie; James G. Lippmann, both of Mesa, and Hiep M. Le, Phoenix, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Apr. 30, 1990, Ser. No. 516,656
Int. Cl.[5] H01L *23/28, 23/02, 23/12, 23/42*
U.S. Cl. 357—72 10 Claims



1. A rectifier comprising:

a metallic base with opposed first and second major faces and a cavity extending into the base from the first face, wherein the cavity has a bottom and a side extending between the bottom and the first face, wherein the bottom of the cavity has a central region for receiving a rectifier die and a peripheral region located between the central region and the side of the cavity;

a rectifier die with one face mounted on the central region of the bottom of the cavity;

a metallic electrode attached to a second, opposed, face of the rectifier and extending away from the base;

an inclined wall located between the central region and the side of the cavity, and having at least the same elevation above the bottom of the cavity as the one face of the rectifier die, and extending upwardly and outwardly from the bottom of the cavity part way toward the first surface; and

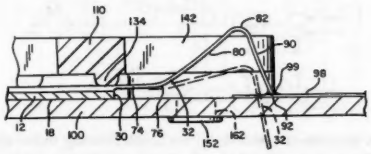
an encapsulation in the cavity covering edges f the rectifier die and the inclined wall.

5,005,070

SOLDERING INTERCONNECT METHOD AND APPARATUS FOR SEMICONDUCTOR PACKAGES

John M. Altendorf, and Marvin G. Wong, both of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 19, 1988, Ser. No. 285,988
Int. Cl.[5] H01L *23/02, 23/12, 39/02, 29/44*
U.S. Cl. 357—74 7 Claims



1. A semiconductor package adapted for attachment by soldering to the conductive traces on a printed circuit board comprising:

an upper exterior surface;

a lower exterior surface substantially parallel to the upper exterior surface; and

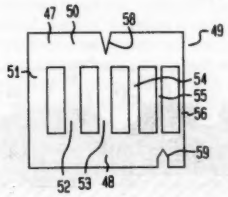
a plurality of leads formed on said upper exterior surface and extending outwardly therefrom, each of said leads comprising a first proximal section lying substantially parallel to said upper exterior surface, a second section connected to said first section and angled therefrom away from said lower exterior surface, and a third terminal section connected to said second section and angled to extend through a plane containing said lower exterior surface.

5,005,071

SEMICONDUCTOR DEVICE

Haruo Amano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 755,897, Jul. 17, 1985, Pat. No. 4,650,744.
This application Dec. 16, 1986, Ser. No. 942,184
Claims priority, application Japan, Jul. 17, 1984, 59-148112
Int. Cl.[5] H01L *23/544*
U.S. Cl. 357—85 3 Claims



1. A semiconductor device comprising a semiconductor substrate having an element forming area and a checking area, a field insulating film formed on said checking area of said semiconductor substrate, and a checking pattern for inspecting an etching condition formed on said field insulating film, said checking pattern including first and second stripe-like frame portions extending in a first direction in parallel with each other, each of said first and second stripe-like frame portions having an inner side line and an outer side line with a constant width between said inner and outer side lines, and a plurality of straight lines bridging respective parts of said inner side lines of said first and second stripe-like frame portions, said straight lines having different widths and extending in parallel with each other in a second direction perpendicular to said first direction with predetermined intervals, a first indicium formed in said first stripe-like frame portion from a part of said outer side line thereof inwardly, said first indicium indicating a pair of parts of respective said inner side lines of said first and second stripe-like frame portions being free from any straight line bridging said pair of parts, and a second indicium being formed in said second stripe-like frame portion from a part of said outer side line thereof inwardly, said second indicium indicating one of said straight lines.

5,005,072

STACKED CELL DESIGN FOR 16-MEGABIT DRAM ARRAY HAVING A PAIR OF INTERCONNECTED POLY LAYERS WHICH ENFOLD A SINGLE FIELD PLATE LAYER AND CONNECT TO THE CELL'S STORAGE NODE JUNCTION

Fernando Gonzalez, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Jan. 29, 1990, Ser. No. 471,998
Int. Cl.[5] H01L *29/68, 29/78, 29/92*
U.S. Cl. 357—23.6 4 Claims

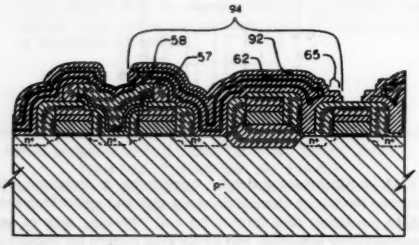
1. In a DRAM cell constructed on a silicon substrate, said cell having a capacitor for strong an electrical charge and a field-effect access transistor through which said capacitor may be charged and discharged, said transistor having a first heavily-doped n-type region within said substrate for a storage-node junction and a second heavily-doped n-type region within said substrate for an access-node junction, said capacitor comprising:

a conductively--doped polysilicon lower storage-node plate layer having upper and lower surfaces and substantially vertical edges, the lower surface of said lower storage-node plate layer being in electrical communication with

said storage-node junction and a portion of the upper surface thereof serving as a tying region;

a first non-oxide dielectric layer superjacent said lower storage-node plate layer, said first dielectric layer being coextensive with said lower storage-node plate layer except in said tying region;

a conductively-doped polysilicon field plate layer superjacent said first dielectric layer and coextensive therewith, said field plate layer having upper and lower surfaces and a substantially vertical edge adjacent to said tying region, said vertical edge having been oxidized to form a dielectric border along its enter length, said first dielectric layer insulating the lower surface of said field plate layer from the upper surface and vertical edges of said lower storage-node plate layer;



a second non-oxide dielectric layer superjacent said field plate layer and said dielectric border, said second dielectric layer being coextensive with said field plate layer and a portion of said dielectric border extending along the entire length of said adjacent vertical edge; and

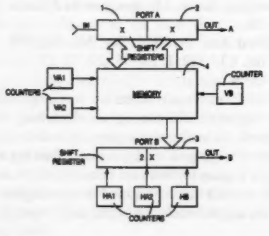
a conductively-doped polysilicon upper storage-node plate/tying layer having upper and lower surfaces, said upper storage-node plate/tying layer being coextensive with said dielectric layer and insulated from the upper surface of said field plate layer by said second dielectric layer, in addition to extending over said dielectric border, being in contact with an edge of said first dielectric layer, and making electrical contact with said tying region of said lower storage-node plate.

5,005,073

DEMULTIPLEXER FOR PROVIDING A COLOR TELEVISION SIGNAL HAVING AN INCREASED IMAGE FREQUENCY

Jean C. Rufray, Brigachtal, and Jean C. Guillon, Erstein, both of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Hanover, Fed. Rep. of Germany

Filed Sep. 30, 1988, Ser. No. 252,051
Int. Cl.[5] H04N 9/64
U.S. Cl. 358—21 R **7 Claims**



1. A demultiplexer for a combined color television signal composed of a plurality of first components containing luminance information and a plurality of second components containing chrominance information, the television signal initially being in a form such that the second components alternate in time with the first components, said demultiplexer comprising:

first shift register means having a plurality of register locations, a serial input connected to receive the television signal in its initial form, parallel inputs and outputs and a serial output;

second shift register means having a plurality of register locations parallel inputs and a serial output;

memory means connected to said parallel inputs and parallel outputs and having a plurality of individually addressable memory locations arranged in rows and columns; and

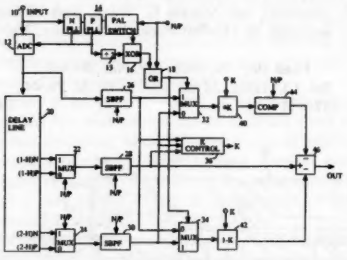
sequence control means including a plurality of address counters connected to said memory means so that each said counter independently addresses a selected group of memory locations, said counters including two write address counters operable for writing each component of the television signal into a respective group of memory locations from said parallel outputs of said first shift register means, and two read address counters operable for reading each first component of the television signal from said memory means to said parallel inputs of one of said shift register means and for reading each second component of the television signal from said memory means to said parallel inputs of the other one of said shift register means, whereby the first components of the television signal are supplied in succession to said serial output of said one register means and the second components of the television signal are supplied in succession to said serial output of the other one of said register means.

5,005,074

ADAPTIVE MULTISTANDARD VIDEO COMB FILTER

Stuart S. Perlman, Princeton, N.J., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Nov. 17, 1989, Ser. No. 437,952
Int. Cl.[5] H04N 9/78
U.S. Cl. 358—31 **12 Claims**



1. A multimode comb filter, for comb filtering video signals of different video signal standards, comprising

a signal input terminal for receiving a video signal;

means including delay means, coupled to said signal input terminal, for selectably providing video signals representing three adjacent horizontal lines of video signal for video signals of first and second standards in first and second modes respectively;

means including combining means, responsive to said video signals representing three adjacent horizontal lines of video signal, for generating a comb filtered signal which at an instant in time comprises a combination of video signals representing two of said three horizontal lines.

5,005,075

X-RAY MASK AND METHOD OF MANUFACTURING AN X-RAY MASK

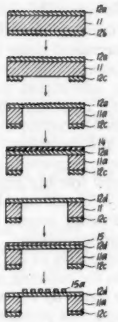
Masato Kobayashi, Miyagi; Yoh-Ichi Yamaguchi, Tokyo; Minoru Sugawara, Tokyo, and Kazuhide Yamashiro, Tokyo, all of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Jan. 30, 1990, Ser. No. 487,771

Claims priority, application Japan, Jan. 31, 1989, 1-22198; Oct. 27, 1989, 1-281132

Int. Cl.[5] G21K *5/00;* H01L *21/306;* B44C *1/22;* C23F *1/00*

U.S. Cl. 378—35 11 Claims



10. An X-ray mask comprising a substrate having a principal surface, an X-ray transmission layer on said principal surface, and an X-ray absorption layer on said X-ray transmission layer, said X-ray transmission layer being subjected to a flattened process and having roughness smaller than 100 angstroms.

5,005,076

DCT VIDEO SIGNAL COMPRESSION DEVICE WITH INTRAFIELD/INTERFIELD SWITCHING AND ADJUSTABLE HIGH FREQUENCY FILTER

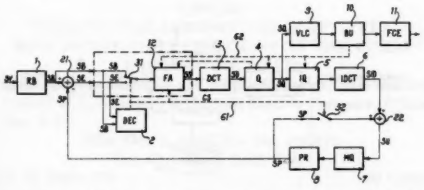
Mario Stroppina, Turin, and Luigi Ronchetti, Como, both of Italy, assignors to RAI Radiotelevisione Italiana S.p.A., Italy

Filed Mar. 6, 1993, Ser. No. 489,486

Claims priority, application European Pat. Off., May 12, 1989, 89830208.8

Int. Cl.[5] H04N *7/12*

U.S. Cl. 358—135 11 Claims



1. A digital video signal compression device comprising:

line-block converter means for converting an incoming digital video signal intrafield blocks each including a predetermined number of adjacent image elements;

a digital adder having a non-inverting input operatively connected to an output of said converter means, an inverting input and an output;

a processing chain including an input, a digital low-pass filter, a DCT transformer and a quantizer connected in cascade to each other;

a variable-length coder connected to an input to an output of said quantizer;

switching means, operatively connected to the output of said converter means, to the output of said adder and to the input of said processing chain, for selectively applying to the input of said processing chain an intrafield block from said converter means during an intrafield mode of operation and an interfield block during an interfield mode of operation;

a predictor chain operatively connected to the output of said quantizer, said predictor chain including an inverse quantizer, an inverse DCT transformer and predicting means for generating a predicted block signal and applying said signal to the inverting input of said adder to generate said interfield block;

selector means, operatively connected to said converter means, said switching means and to the output of said adder, for comparing each intrafield block with a corresponding interfield block and setting said switching means in said intrafield mode of operation if such intrafield block has less information content than said corresponding interfield block and alternatively setting said switching means in said interfield mode of operation if such intrafield block has greater information content than said corresponding interfield block; and

output buffer means operatively coupled to said variable-length coder for temporarily storing compressed video signals therefrom, said buffer means being operatively connected to said quantizer and inverse quantizer for changing quantization resolutions thereof inversely with a fill rate of said buffer means, said buffer means being operatively coupled to said filter for varying an upper cutoff frequency thereof inversely with the buffer fill rate.

5,005,077

MOTION DEPENDENT VIDEO SIGNAL PROCESSING

Raphael Samad, and Clive H. Gillard, both of Basingstoke, United Kingdom, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 20, 1990, Ser. No. 511,739

Claims priority, application United Kingdom, Apr. 27, 1989, 8909651

Int. Cl.[5] H04N *7/01*

U.S. Cl. 358—140 10 Claims

1. A motion compensated video standards converter for converting a video signal conforming to a first video standard to a converted video signal conforming with a second video standard, said video signal being provided as a sequence of intervals selected from fields and frames, each of said intervals being arranged in a plurality of blocks each representing a portion of an image represented by said video signal, comprising:

motion vector deriving means for comparing each of a plurality of blocks in a first interval of said video signal with a plurality of blocks in an adjacent interval of said video signal for deriving motion vectors representing motion of the image portion represented by respective ones of said blocks between said first interval and said adjacent interval;

motion vector assigning means to assign to respective ones in a group of blocks in said first interval adjacent to a border region thereof, motion vectors selected from motion vectors which have been derived for blocks of said first interval which are adjacent to said respective ones in said group of blocks and which are outside said border region; and

interpolator means for producing said converted video signal, said interpolator means being controlled at least in dependence on the assigned motion vectors.

5,005,078

MOTION DEPENDENT VIDEO SIGNAL PROCESSING

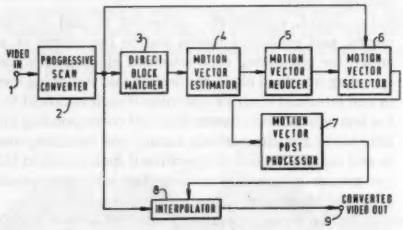
Clive H. Gillard, Cheneham, United Kingdom, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 20, 1990, Ser. No. 513,426

Claims priority, application United Kingdom, Apr. 27, 1989, 8909645

Int. Cl.[5] H04N 7/01

U.S. Cl. 358—140 8 Claims



1. A motion compensated video standards converter for converting an input video signal having a first standard format to a motion compensated video signal having a second standard format, said converter comprising:

progressive scan converter means for receiving said input video signal having said first standard format and for converting fields of said input video signal to video signal progressive scan frames;

comparator means coupled to said progressive scan converter means for comparing blocks in a first progressive scan frame of said video signal with a plurality of blocks in the following progressive scan frame of said video signal, said comparator means deriving motion vectors which represent the motion of the content of the respective blocks compared between said first frame and said following frame; and

interpolator means for interpolating said scan frames from said progressive scan converter means in dependence on said motion vectors to produce said motion compensated video signal having said second standard format.

5,005,079

AUTOMATIC FREQUENCY CONTROL CIRCUIT

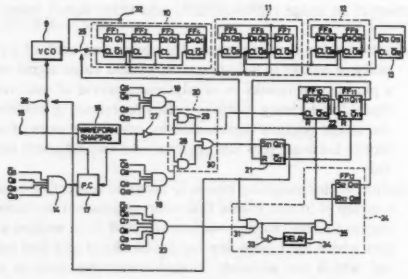
Hideo Satomi, Nitta, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed Mar. 13, 1990, Ser. No. 492,759

Claims priority, application Japan, Mar. 16, 1989, 1-65528

Int. Cl.[5] H04N 5/04

U.S. Cl. 358—158 2 Claims



1. An automatic frequency control circuit comprising:

voltage controlled oscillator means for providing an oscillating output signal having a frequency which changes in response to a control input;

frequency dividing means for frequency dividing the oscillating output signal of said voltage controlled oscillator means by a predetermined division ratio;

phase comparing means for comparing phases of an externally supplied input reference signal and an output signal of said frequency dividing means to generate an error output and supply the error output to said voltage controlled oscillator means as said control input such that said input reference signal and the output signal of said frequency dividing means enter a phase-locked state wherein both the input reference signal and the output signal of said frequency dividing means have a predetermined phase relation;

miss-lock detecting means for detecting the phase relation between said input reference signal and the output signal of said frequency dividing means entering a miss-lock state out of said predetermined phase relation;

frequency division interrupting means responsive to a detection signal in the miss-locked state from said miss-lock detecting means for once interrupting a frequency dividing operation of said frequency dividing means at a predetermined timing, and thereafter, restarting the frequency dividing operation in response to a subsequent input reference signal, thereby forcibly restoring the phase locked state of said input reference signal and the output signal of said frequency dividing means, said frequency division interrupting means comprising:

counter means responsive to the output of said miss-lock detecting means for counting pulses of said subsequent input reference signal by a predetermined number;

means for defining a first period starting from said predetermined timing after the detection of said miss-lock state until the end of the counting by said counter means; and

a first switch for cutting off the supply of the oscillating output signal of said voltage controlled oscillator means for said frequency dividing means during said first period; and

an output terminal for taking out an output of said voltage controlled oscillator means.

5,005,080

METHOD AND APPARATUS OF IMAGE PROCESSING

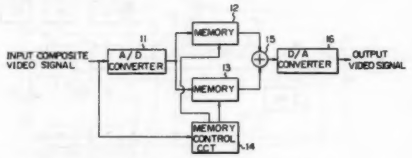
Masao Kanda, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 13, 1988, Ser. No. 193,744

Claims priority, application Japan, May 15, 1987, 62-118236; Jun. 4, 1987, 62-140694; Jun. 5, 1987, 62-141013

Int. Cl.[5] H04N 5/14

U.S. Cl. 358—160 6 Claims



1. An image processing apparatus comprising:

an analog to digital converting means for digitizing an input composite video signal representing an image into a digital composite video signal, said digital composite signal comprised of a series of fields;

a first memory means for storing said digital composite video signal;

a second memory means for storing said digital composite video signal;

memory control means for controlling writing and reading timings of said first and second memory means such that one field of said digital composite video signal obtained for every four fields of said digital composite video signal is sequentially written in said first memory means and a

stored content of said first memory means is sequentially read out in the order of storing said digital composite signal, and one field which is identical to any one field of a field group stored in said first memory means is sequentially written in said second memory means at intervals longer than intervals of the field stored in said first memory means, and a stored content of said second memory means is read out sequentially in the order of storing said digital composite signal;

adding means for adding together the contents of said first and second memory means; and

a digital to analog converting means for outputting an analog composite video signal corresponding to the combined contents of said first and second memory means.

5,005,081

METHOD AND APPARATUS FOR REDUCING NOISE IN A VIDEO SIGNAL

Mitsuyasu Asano, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

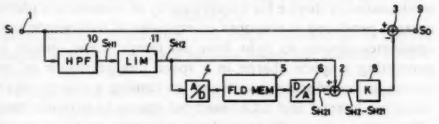
PCT No. PCT/JP88/00286, § 371 Date Jan. 10, 1989, § 102(e) Date Jan. 10, 1989, PCT Pub. No. WO88/07307, PCT Pub. Date Sep. 22, 1988

PCT Filed Mar. 18, 1988, Ser. No. 294,663

Claims priority, application Japan, Mar. 20, 1987, 62-67403

Int. Cl.[5] H04N *5/213*

U.S. Cl. 358—167 **11 Claims**



1. A method of reducing noise in a video signal, comprising:

passing said video signal through a high pass filter to create a high frequency signal;

passing said high frequency signal through a limiter to produce a first signal;

delaying said first signal to produce a second signal;

subtracting said second signal from said first signal to produce a difference signal;

subtracting said difference signal from said video signal such that any noise in said video signal is reduced.

5,005,082

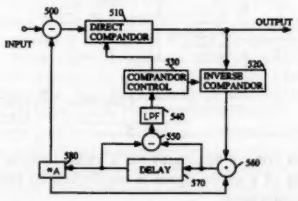
VIDEO SIGNAL COMPANDER ADAPTIVELY RESPONSIVE TO PREDICTIONS OF THE VIDEO SIGNAL PROCESSED

Joel W. Zdepski, Lebanon, and Joshua L. Koslov, East Windsor, both of N.J., assignors to General Electric Company, Princeton, N.J.

Filed Oct. 3, 1989, Ser. No. 416,695

Int. Cl.[5] H04N *5/52, 7/12*

U.S. Cl. 358—174 **20 Claims**



1. An adaptive compansion system for processing a video signal comprising:

means for applying an adaptively companded signal representing a video signal;

an adaptive compandor having an output terminal and a control terminal, and having a plurality of compansion transfer characteristics selectably responsive to a control signal applied to said control terminal, said adaptive compandor being responsive to said adaptively companded signal for performing a compansion function to produce a noncompanded signal representing said video signal;

means coupled to the output terminal of said adaptive compandor for providing an output video signal;

means responsive to said output video signal for generating a signal indicative of an attribute of said video signal;

means responsive to said signal indicative of an attribute of said video signal for generating said control signal.

5,005,083

FLIR SYSTEM WITH TWO OPTICAL CHANNELS FOR OBSERVING A WIDE AND A NARROW FIELD OF VIEW

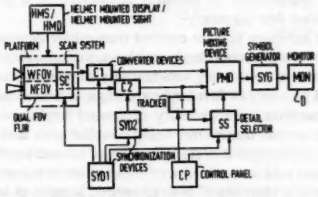
Ludger Grage, Eichenau, and Paul Dato, Emmering, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 19, 1989, Ser. No. 354,208

Claims priority, application Fed. Rep. of Germany, May 19, 1988, 3817159

Int. Cl.[5] H04N *5/268, 7/18*

U.S. Cl. 358—181 **19 Claims**



1. A method for observing a scene, comprising the steps of:

directing an image pick-up side of an infrared imaging system having two optical channels with different fields of view at a scene to be observed to obtain a picture signal of the scene to be observed having a wide field of view and having a narrow field of view;

converting said picture signals of said two optical channels into two television video signals through two converter devices;

synchronizing said two television video signals to one another with a first synchronization device;

supplying said two television video signals to a picture mixing device;

selecting only a detail of said television video signal of said narrow field of view by a detail selector;

mixing said detail with said television video signal of said wide field of view in said picture mixing device to form a mixed video signal; and

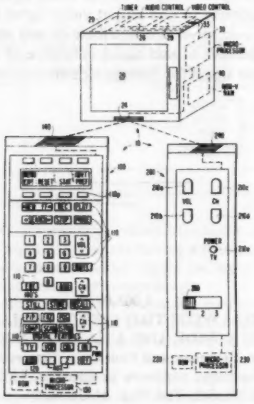
portraying said mixed video signal on a single image portrayal device in such fashion that an overview of the scene to be observed from the wide field of view channel appears simultaneously with a mixed-in picture detail of said narrow field of view channel in a portrayed picture.

5,005,084

REMOTE CONTROL TELEVISION SYSTEM USING SUPPLEMENTARY UNIT FOR SIMPLIFIED PERSONALIZED CONTROL

Kenneth R. Skinner, Jefferson City, Tenn., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 19, 1989, Ser. No. 452,983
Int. Cl.[5] H04N 5/44; H03J 9/06
U.S. Cl. 358—194.1 20 Claims



1. A television system comprising:

(a) a first remote control transmitter device having a plurality of first keyboard keys and a first infrared transmitter which are coupled such that the pressing of respective of said plurality of first keyboard keys causes said first infrared transmitter to transmit respective of a plurality of desired first signals;

(b) an auxiliary remote control transmitter device having a plurality of second keyboard keys, said plurality of second keyboard keys being substantially smaller in number than said plurality of first keyboard keys, and a second infrared transmitter, said plurality of second keyboard keys and said second transmitter being coupled such that the pressing of respective of said plurality of second keyboard keys causes said second infrared transmitter to transmit respective of a plurality of desired second signals, at least one of said desired second signals being uniquely distinguishable from all of said desired first signals; and

(c) a television having an infrared receiver means for receiving said desired first and desired second signals; parameter control means for effecting control over an audio or video parameter of said television; a microprocessor coupled to the infrared receiver means for determining the meaning of said desired first and desired second signals, and coupled to the parameter control means for controlling the parameter control means in response to the received desired signals; and a programmable memory means for storing values for a plurality of personal preference parameter rings, including a value for at least said audio or video parameter, at least one of said plurality of personal preference parameter rings being associated with said uniquely distinguishable desired second signal of said auxiliary remote device, said programmable memory means being coupled to said microprocessor,

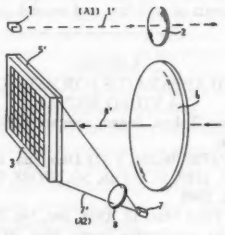
wherein said programmable memory means is programmable when said television is in a programmable mode, and said programmable memory means is programmed with said values for said plurality of personal preference parameter rings by the pressing of a desired sequence of said first remote control transmitter device first keyboard keys.

5,005,085

CONTROLLABLE SEMICONDUCTOR IMAGE SENSOR AND ARRANGEMENT WITH SUCH A SENSOR

Hans Spies, Pfaffenhofen; Alfons Woehrl, Schrobenhausen, and Martin Spies, Pfaffenhofen, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 22, 1989, Ser. No. 440,601
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1988, 3839512
Int. Cl.[5] H04N 5/335, 3/14, 5/30
U.S. Cl. 358—213.11 10 Claims



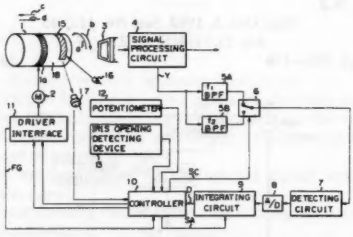
1. A controllable semiconductor image sensor, comprising a sensor semiconductor device, CCD-read-out means as part of said sensor semiconductor device for reading-out sensed image information, avalanche diode means arranged in said sensor semiconductor device for amplifying by an avalanche a photon current produced in response to exposure of said sensor semiconductor device to light from an image scene, means for generating a space charge in a space charge region of said sensor semiconductor device and for causing a charge carrier transport toward said CCD-read-out means to provide image information at said CCD-read-out means in response to said image scene light, and control light source means for directing control light impulses onto said space charge region for optically controlling said sensor semiconductor device.

5,005,086

FOCUS CONTROL APPARATUS HAVING TWO FOCUSING SPEEDS

Koji Iwamoto, Tokyo; Kenichi Hamada, and Katsuaki Hirota, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 2, 1989, Ser. No. 318,138
Claims priority, application Japan, Mar. 4, 1988, 63-051294; Mar. 4, 1988, 63-051293; Aug. 29, 1988, 63-214360
Int. Cl.[5] H04N 3/26
U.S. Cl. 358—227 5 Claims



1. Focus control apparatus for a video camera in which a component of a video signal is maximized to perform focus control, comprising:

means for extracting a signal having a predetermined frequency component from a video signal;

means for moving a position of a lens in quest of an in-focus position at which said lens is correctly focused;

means for sampling the signal of predetermined frequency component extracted from the video signal at at least continuous, successive first, second, and third lens positions;

means for determining a first gradient indicative of a change in value of the signal of predetermined frequency component for a change in lens position between said first and second lens positions from the signal of the predetermined frequency component sampled at the first lens position and the signal of predetermined frequency component sampled at the second lens position;

means for determining a second gradient indicative of a change in value of the signal predetermined frequency component for a change in lens position between said second and third lens positions from the signal of the predetermined frequency component sampled at the second lens position and the signal of predetermined frequency component sampled at the third lens position; and

control means responsive to a relationship between said first and second gradients for effecting relatively rapid movement of said lens when said lens is relatively distant from said in-focus position and relatively slow movement of said lens when said lens is relatively close to said in-focus position.

5,005,087
SIGNAL PROCESSING DEVICE FOR AUTOMATIC-FOCUSING VIDEO SIGNAL IN ELECTRONICALLY CONTROLLED PHOTOGRAPHIC CAMERA

Noboru Suzuki; Shigeo Toji, and Yukio Uenaka, all of Tokyo, Japan, assignors to Asahi Kogaku Kabushiki Kaisha, Tokyo, Japan

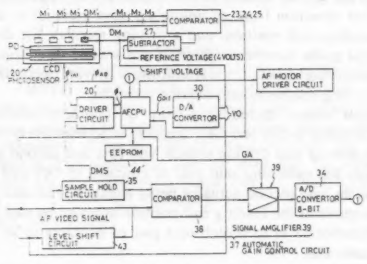
Continuation of Ser. No. 173,449, Mar. 25, 1988. This application Aug. 22, 1989, Ser. No. 396,632

Claims priority, application Japan, Mar. 26, 1987, 62-45016[U]; Mar. 26, 1987, 62-72916

The portion of the term of this patent subsequent to Oct. 24, 2006, has been disclaimed.

Int. Cl.[5] H04N *5/232;* **G03B** *3/00, 13/18*

U.S. Cl. 358—227 **15 Claims**



1. A signal processor for an automatic-focusing video signal in an electronically controlled camera, comprising:

a photosensor having an electric charge accumulating part for accumulating an electric charge signal which corresponds to an object brightness, said photosensor being adapted to sequentially transmit said electric charge signal accumulated in said electric charge accumulating part; and

an automatic gain control circuit for automatically controlling the gain of said automatic-focusing video signal produced from said photosensor when said object contrast is low, in such a manner that a low-contrast corresponding level difference, which is the difference between a high-luminance corresponding level and a low-luminance corresponding level of an automatic-focusing video signal arising from a low-contrast object, approaches a high-contrast corresponding level difference, which is the difference between a high-luminance corresponding level and a low-luminance corresponding level of an automatic-focusing video signal arising from a high-contrast object.

5,005,088
RECORDING AND/OR REPRODUCING APPARATUS ADAPTED TO MINIMIZE ELECTRICAL ENERGY CONSUMPTION

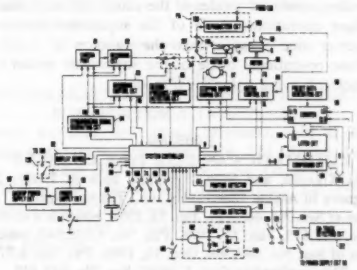
Nobuo Fukushima; Shinji Sakai; Osamu Takdea; Masahiro Takei; Yasutomo Suzuki; Tadashi Okino, and Shigeru Jinnai, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 356,608, May 24, 1989, abandoned, which is a continuation of Ser. No. 51,477, May 18, 1987, abandoned. This application Jan. 8, 1990, Ser. No. 462,102

Claims priority, application Japan, May 21, 1986, 61-116955; May 21, 1986, 61-116956; May 21, 1986, 61-116957; May 21, 1986, 61-116958; May 21, 1986, 61-116959; May 21, 1986, 61-116964; May 21, 1986, 61-116983; May 21, 1986, 61-116984; May 21, 1986, 61-116986

Int. Cl.[5] G11B *15/18, 17/00, 19/02*

U.S. Cl. 360—69 **44 Claims**



1. A recording and/or reproducing apparatus comprising:

(a) means for loading a recording medium on said apparatus;

(b) means for detecting the presence or absence of information recorded at recording or reproducing position on said recording medium loaded on the apparatus;

(c) supply means for supplying electric energy at least to said detecting means; and

(d) control means for causing said supply means to supply said electric energy to said detecting means in response to a loading action of said loading means and for causing the supply means to stop in accordance with the completion of the detection action of said detecting means.

5,005,089
HIGH PERFORMANCE, HIGH CAPACITY MICRO-WINCHESTER DISK DRIVE

William N. Thanos; Bruce R. Peterson, both of San Jose; William G. Moon, Sunnyvale; Joshua Lindsay, Cupertino, and Thomas R. Stone, Pleasanton, all of Calif., assignors to Quantum Corp., Milpitas, Calif.

Filed May 10, 1988, Ser. No. 192,353

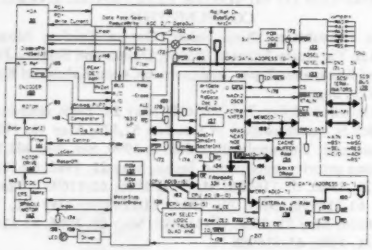
Int. Cl.[5] G11B *5/596*

U.S. Cl. 360—77.08 **22 Claims**

1. A disk drive subsystem including integral data block sequencer means, cache memory means and interface means for direct memory access interface with a host computing machine and further including a disk forming data storage surfaces, the disk being mounted to a spindle journalled to a base, an electromechanical head transducer actuator structure mounted to the base for moving a plurality of data transducer heads among a multiplicity of concentric data tracks formed on

each data storage surface of the disk, the subsystem further comprising:

single, time divided multi-tasked digital supervisor means programmed for supervising track seeking, micro-stepping and following servo control operations of the actuator structure during a servo control phase of a two-phase operational cycle being a supervision phase devoted to supervision of data block handling functions of disk drive



data block sequencer means, cache memory means and interface means, the digital supervisor means being programmed so that during track seeking and micro-stepping settle operational modes of the subsystem each said two-phase operational cycle of the supervisor means is of shorter time duration than the duration of a said two-phase operational cycle of the supervisor means during track following operational modes.

5,005,090

AUTOMATIC CASSETTE TAPE CHANGER

Takashi Kikuchi, and Shigeo Aoyagi, both of Iwaki, Japan, assignors to Alpine Electronics Inc., Tokyo, Japan

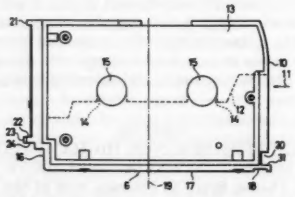
Division of Ser. No. 465,714, Jan. 16, 1990, which is a division of Ser. No. 207,671, Jun. 16, 1988, Pat. No. 4,918,542, which is a division of Ser. No. 807,368, Dec. 10, 1985, Pat. No. 4,777,547.

This application Oct. 1, 1990, Ser. No. 591,348

Claims priority, application Japan, Dec. 10, 1984, 59-186121[U]; Dec. 10, 1984, 59-186122[U]; Dec. 10, 1984, 59-186123[U]; Dec. 10, 1984, 59-186124[U]; Dec. 10, 1984, 59-196125[U]

Int. Cl.[5] G11B *15/68*

U.S. Cl. 360—92 **4 Claims**



1. An automatic cassette tape changer having:

a tape container having side plates for containing a plurality of cassette tapes, said tape container having a first hole passing through each of its side plates, said first hole being located at a position corresponding to a rotatable hub of a cassette tape disposed in said tape container, said tape container having a plurality of partition walls forming tape cassette receiving portions within said tape container, said partition walls being provided with a plurality of cut portions therein corresponding to said position of said rotatable hub of said cassette tape; and

a hub locking member passing through said first hole in said side plates, said cut portions, and a plurality of cassette tape hubs in line with said first hole and said cut portions for restraining rotational movement of said hubs.

5,005,091

CASSETTE LOADING APPARATUS WITH SINGLE SWITCH CONTROL

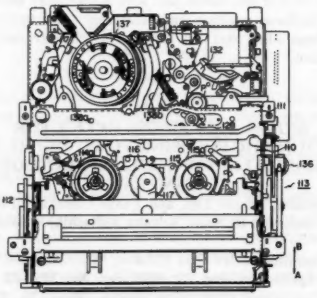
Hisanaga Tsujimoto, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 27, 1989, Ser. No. 457,562

Claims priority, application Japan, Dec. 28, 1988, 63-333616

Int. Cl.[5] G11B *5/008*

U.S. Cl. 360—96.5 **7 Claims**



1. A cassette loading apparatus comprising:

a cassette holder which houses a cassette to be loaded and is arranged to be movable in a substantially horizontal state;

loading means including a guide member for guiding said cassette holder so as to load the cassette in a first direction from a loading start position to a loading end position and to unload the cassette in a second direction opposite to the first direction from an unloading start position to an unloading end position, and a driving member for driving said guide member in the first and second directions;

transmitting means for transmitting a driving force from a driving source to said driving member;

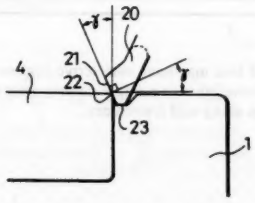
switch means including a pair of contacts which are switched to ON and OFF states so as to selectively supply power to said driving source, and first and second actuators for switching said pair of contacts to ON and OFF states, said second actuator being engaged with said guide member at the loading end position assumed by said guide member so as to switch said pair of contacts to an OFF state; and

a switching member including first and second engaging portions which can be freely engaged with said driving member and said first actuator of said switch means, engagement of said first engaging portion with said driving member being released at the loading start position assumed by said guiding member so as to cause said second engaging portion to be engaged with said first actuator of said switch means, thereby switching said pair of contacts to an ON state, and said first engaging portion being engaged with said driving member at the unloading end position assumed by said guide member so as to cause said second engaging portion to be disengaged from said first actuator, thereby switching said pair of contacts to an OFF state.

5,005,092
SHUTTER OPENING DEVICE

Osamu Shigenai, Furukawa, and Keiichi Sato, Shiogama, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Dec. 26, 1989, Ser. No. 456,921
Claims priority, application Japan, Apr. 7, 1989, 1-40478[U]
Int. Cl.[5] G11B *17/02*
U.S. Cl. 360—99.06 **2 Claims**

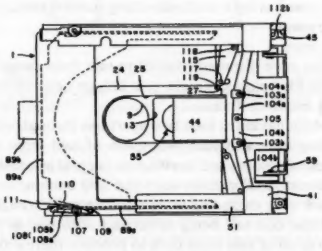


1. In a shutter opening device including a lever member rotatably supported at a deepest portion of a cartridge holder of a disc driving device with respect to an inserting direction of a disc cartridge and means for normally elastically biasing said lever member in an ejecting direction of said disc cartridge, said disc cartridge having a case formed with a head insertion opening and a shutter so mounted as to ride over one end of said case for normally closing said head insertion opening, said lever member being adapted to contact an end surface of said shutter upon insertion of said disc cartridge and open said shutter in a direction perpendicular to the inserting direction of said disc cartridge according to an inserting force of said disc cartridge; the improvement wherein said lever member has a contact end portion for contacting said shutter, said contact end portion being formed with an inclined surface having an angle of inclination from a plane perpendicular to a sliding direction of said shutter and further formed with a front end adapted to first contact said case of said disc cartridge, said inclined surface being adapted to contact a corner of said shutter, said angle of inclination of said inclined surface being set such that a force to be applied to said shutter by said lever member in a disengaging direction of said shutter upon contacting of said inclined surface with said corner is in a predetermined range not generating disengagement of said shutter.

5,005,093
RECORDING AND/OR REPRODUCING APPARATUS WITH CARTRIDGE LOCK MECHANISM

Yoshihisa Inoue, Saitama, and Yasunori Arai, Tokyo, both of Japan, assignors to Nakamichi Corporation, Tokyo, Japan

Continuation of Ser. No. 265,212, Oct. 31, 1988, Pat. No. 4,899,238. This application Dec. 13, 1989, Ser. No. 450,246
Claims priority, application Japan, Oct. 31, 1987, 62-276778
Int. Cl.[5] G11B *5/012*
U.S. Cl. 360—99.06 **9 Claims**



1. A recording and/or reproducing apparatus for performing recording and/or reproducing operation with respect to a disc contained in a disc cartridge, comprising:

a main chassis;

a holder secured to said main chassis for accommodating the disc cartridge;

shutter actuating means for opening a laterally slidable shutter of the disc cartridge along with insertion thereof into said holder in a direction substantially perpendicular to the sliding direction of said shutter;

a base for mounting thereon a head for transducing signals from a recording medium in opposition to one side of the disc and a spindle motor for rotating the disc, said base being displaceable between a first position retracted away from said holder and a second position close to said holder to make operative said head and said spindle with respect to the disc contained in the full-loaded disc cartridge in said holder;

cartridge lock means for locking the disc cartridge in a full-loaded position, including a lock lever engageable with a corresponding engaging portion of the disc cartridge and first spring means for biasing said lock lever and said corresponding engaging portion is released;

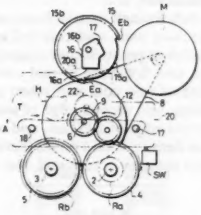
detect means for detecting that the disc cartridge has reached the full-loaded position in said holder; and

control means operated in response to detection by said detect means to actuate said cartridge lock means against said first spring means to lock the disc cartridge in the full-loaded position and then to shift said base to said second position.

5,005,094
MODE CHANGEOVER MECHANISM WITH FLAT CAM SURFACE FOR A TAPE PLAYER

Norimasa Komatsu, and Asashi Miyazaki, both of Kakuda, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1989, Ser. No. 424,359
Claims priority, application Japan, Dec. 12, 1988, 63-161741[U]; Feb. 10, 1989, 1-15065
Int. Cl.[5] G11B *5/008, 5/54*
U.S. Cl. 360—105 **5 Claims**



1. A mode changeover mechanism for a tape player for recording signals on a magnetic tape and reproducing signals recorded on the magnetic tape, comprising:

a base plate, a magnetic head mounted on said base plate, said base plate disposed to move toward the magnetic tape to bring the magnetic head into contact with the magnetic tape and away from the magnetic tape to separate the magnetic head from the magnetic tape, said base plate moving in a direction of movement which is substantially along a straight line;

a spring biasing said base plate away from the magnetic tape to separate the magnetic head from the magnetic tape;

a changeover cam for moving said base plate toward the magnetic tape against the resilience of the spring; and

a motor for driving the changeover cam for rotation;

characterized in that the changeover cam has a flat cam surface, and when said flat cam surface is in contact with said base plate, said base plate is in a position such that the magnetic head is in contact with the magnetic tape, and

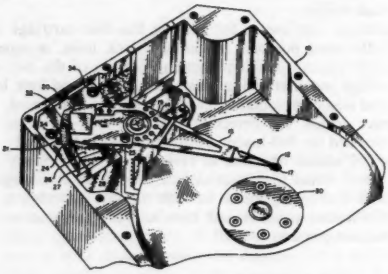
while said base plate is in said position, said flat cam surface is disposed perpendicular to and intersecting a center line passing through the center of rotation of the change-over cam, said center line extending in a direction parallel to said direction of movement of said base plate.

5,005,095

ACTUATOR FOR LINEARIZING TORQUE IN A DISK DRIVE SYSTEM

J. Arthur Wagner, San Jose, Calif., assignor to Maxtor Corporation, San Jose, Calif.

Filed May 2, 1990, Ser. No. 518,078
Int. Cl.[5] G11B *5/55*
U.S. Cl. 360—106 **12 Claims**



1. In a magnetic recording system which includes a magnetic disk for storing data in a pattern of remnant magnetization, a rotary moving coil actuator for selectively positioning a transducer across said disk to access data stored thereon, said actuator comprising:

a frame having a pair of radial slots;

a body pivotable about an axis;

a pair of magnets mounted to said frame along said slots;

a coil securely attached to said body, said coil passing through said radial slots and adjoining said magnets, said coil moving across said slots in an arcuate path from a first position to a second position, thereby pivoting said body, during a data stroke; and

at least one notch formed in said frame at a point midway along said arcuate path, said coil and notch each having first and second edges such that when said coil is in said first position, said first edge of said notch coincides with said first edge of said coil, and when said coil is in said second position, said second edge of said notch coincides with said second edge of said coil, said notch reducing the magnetic flux density at said point, thereby linearizing the torque of said actuator across said data stroke.

5,005,096

MAGNETORESISTIVE READ TRANSDUCER HAVING HARD MAGNETIC SHUNT BIAS

Mohamad T. Krounbi, San Jose; Otto Voegeli, Morgan Hill; and Po-Kang Wang, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 21, 1988, Ser. No. 287,970
Int. Cl.[5] G11B *5/127*
U.S. Cl. 360—113 **15 Claims**

1. A magnetoresistive read transducer comprising:

a thin film of magnetoresistive conductive layer formed of magnetic material, said magnetoresistive conductive layer having passive end regions separated by a central active region; and

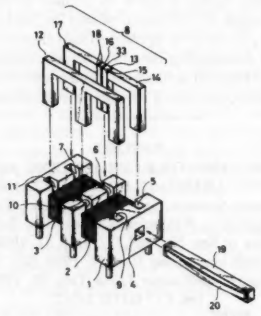
means for producing a longitudinal magnetostatic bias in the passive end regions of said magnetoresistive layer, said means for producing a longitudinal bias comprising separate thin films of hard magnetic material parallel to, but spaced from, said magnetoresistive layer, said separate thin films of hard magnetic material existing substantially in each of the passive end region only, and said separate thin films of hard magnetic material being magnetized in a chosen direction along said transducer whereby said longitudinal bias maintains said active regions of said magnetoresistive layer in a single domain state in said chosen direction along said transducer.

5,005,097

MAGNETIC HEAD WITH A COIL AND CORE SUPPORTING BOBBIN

Seigou Matsuoka, Arao, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 4, 1989, Ser. No. 293,776
Int. Cl.[5] G11B *5/265, 5/17*
U.S. Cl. 360—121 **2 Claims**



1. A magnetic head comprising:

at least one coil;

a front core having a media-touching portion and at least one protrusion;

a back core;

a dummy core disposed parallel to said front core; and

a bobbin for holding thereon said at least one coil for generating magnetic flux,

said bobbin having at least two apertures through which said dummy core and said protrusion of said front core are respectively disposed to effect an integral assembly of said front core, said dummy core and said bobbin,

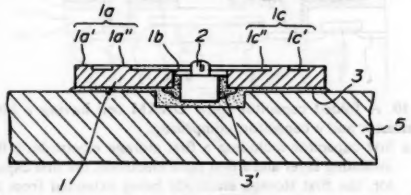
said back core extending in said bobbin and through said at least one coil and being in contact with said at least one protrusion of said front core to produce therewith at least one magnetic path for said magnetic flux.

5,005,098

DISK DRIVE WITH STABILIZER BLOCK FOR INSURING STABLE CONTACT BETWEEN A READ/WRITE HEAD AND A FLEXIBLE RECORDING MEDIUM

Tokio Kanada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 12, 1989, Ser. No. 364,121
Claims priority, application Japan, Jun. 15, 1988, 63-147101
Int. Cl.[5] G11B *5/60, 21/21*
U.S. Cl. 360—130.34 30 Claims



1. A stabilizer block structure for a contact-type disk drive unit, in which information to be recorded and/or reproduced is transferred between a flexible storage medium disk and a reading and/or writing head being held in contact with each other, said stabilizer block structure comprising:

a stabilizer block body defining a head receptacle opening for securing said reading and/or writing head therein;

a contact surface incorporated with said stabilized block body and oriented on one side of said stabilizer block body, for defining a contact area for establishing contact with said flexible storage medium disk, the surface area of said contact area being less than a surface area of said one side of said stabilizer block body; and

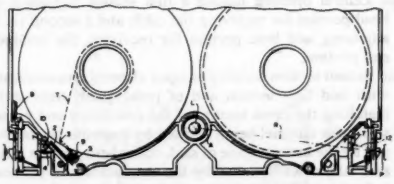
at least one void formed on said one side of said stabilizer block body, said void being substantially surrounded by said contact area and said void surrounding said reading and/or writing head for defining a vacuum chamber in cooperation with said flexible storage medium disk for generating a Bernoulli drawing force for drawing said flexible storage medium disk to establish steady head-to-disk contact while said flexible storage medium disk is rotatingly driven.

5,005,099

METHOD AND APPARATUS FOR THE PREVENTION OF FAST-FORWARDING OF A VIDEO CASSETTE TAPE

James D. Perryman, 1449 Richland Rd. #9, Auburn, Ala. 36830, and John M. Green, 125 Eufaula St., Gulf Breeze, Fla. 32561

Filed Dec. 18, 1989, Ser. No. 451,562
Int. Cl.[5] G11B *23/02, 15/48*
U.S. Cl. 360—132 4 Claims



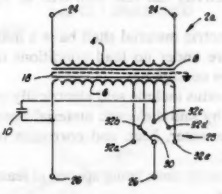
1. In a video cassette recorder having a motor for driving the supply reel and take-up reel for moving a video tape in a video tape cassette at a first play/record speed and a second fast forward/rewind speed, and standard photoelectric circuitry for sensing the clear leader and trailer in a video tape cassette to stop said recorder when the beginning or end of said tape is reached, a method for preventing the fast-forwarding of said video tape cassette in said video cassette recorder comprised of sensing said second speed of said tape in said cassette, and activating said standard photoelectric circuitry of said video cassette recorder for sensing the end of said tape to cause said video cassette recorder to stop.

5,005,100

TRANSIENT-FILTERED TRANSFORMER

Donald W. Owen, Yukon, Okla., assignor to Southwest Electric Company, Oklahoma City, Okla.

Filed Aug. 2, 1989, Ser. No. 389,312
Int. Cl.[5] H02H *7/04*
U.S. Cl. 361—35 15 Claims



1. A transient-filtered transformer, comprising:

an electrically conductive primary winding;

an electrically conductive secondary winding inductive by coupled to said primary winding for providing an output voltage, said secondary winding having leakage reactance; and

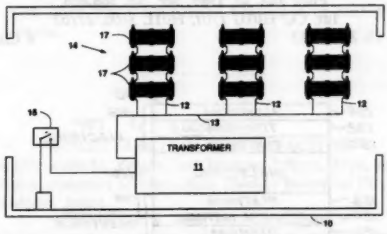
capacitance connected directly across less than the full length of said secondary winding wherein said capacitance is rated for less than the full output of said secondary winding, said capacitance combining only with said leakage reactance so that an inductive-capacitive filter is formed for reducing high frequency voltage transients magnetically induced in said secondary winding.

5,005,101

METHOD AND APPARATUS FOR NEGATIVE CHARGE EFFECT AND SEPARATION OF UNDESIRABLE GASES

James C. Gallagher, and Michael K. Gallagher, both of 105 Villa Ann, San Antonio, Tex. 78213

Filed Jan. 31, 1989, Ser. No. 304,275
Int. Cl.[5] H01J *3/04*
U.S. Cl. 361—231 3 Claims



1. An electrical discharge generator apparatus comprising:

at least two electrode units each having an electrically conductive plate such as stainless steel covered by a dielectric material bonded to the conductive plate, said electrode units being disc like in a spaced relationship, and said electrode units having an assembly notch, a tubular electrically conductive spacer and insulating washer, with the electrode units and spacer and insulating washer having an assembly rod capable of passing through the aligned spacers, washer, and electrode units, the rods being

threaded are fitted with nuts tightened to compress in a good physical and electrical contact, all being mounted and connected to a transformer which is then connected to a switch controlling the power to the transformer primary winding, wherein the improvement comprises the combination that includes:

a. the apparatus includes a plurality of electrode units each having an electrically conductive plate having a surface covered by a dielectric material wherein:

said dielectric material shall have a minimum dielectric strength of 10 kilovolts per millimeter;

said dielectric material shall have a minimum dielectric constant of 9.7 kilohertz;

said dielectric material shall have a minimum thermal conductivity not less than 0.05 at 20 degrees centigrade;

said dielectric material shall have a maximum use temperature under no load conditions of at least 1,300 degrees centigrade;

b. the apparatus include said electrically conductive plate covered by said dielectric material bonded together by a flexible water, heat, and corrosion resistant silicone adhesive;

c. said electrode units being spaced at least 0.330 centimeters apart;

d. said electrically conductive spacer being made of the same dielectric material used for the electrically conductive plate surface;

e. said washer being made from the same material used for said electrically conductive plate;

f. said transformer for supplying electrical power between said electrode units being sufficient to generate a glow type of discharge between said plates, said transformer having a minimum power rating of at least 7,000 volts at 30 milliamps when supplied with 110 volts at 60 hertz, and said transformer being midpoint grounded.

5,005,102

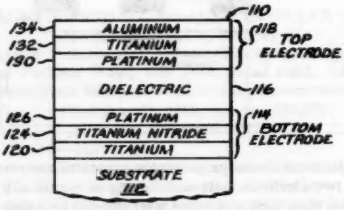
MULTILAYER ELECTRODES FOR INTEGRATED CIRCUIT CAPACITORS

William L. Larson, Colorado Springs, Colo., assignor to Ramtron Corporation, Colorado Springs, Colo.

Filed Jun. 20, 1989, Ser. No. 368,668

Int. Cl.[5] H01G *1/01*; H01L *3/00, 27/02*

U.S. Cl. 361—313 **8 Claims**



3. A capacitor for an integrated circuit comprising:

first and second electrodes;

a dielectric located between said electrodes;

one of said electrodes comprising a plate layer adjacent to said dielectric and a further layer, wherein said further layer comprises a layer of titanium and a layer of titanium nitride.

5,005,103

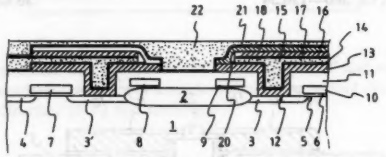
METHOD OF MANUFACTURING FOLDED CAPACITORS IN SEMICONDUCTOR AND FOLDED CAPACITORS FABRICATED THEREBY

Oh-Hyun Kwon; Taek-Yong Jang; Jung-Hyun Shin, and Won-Taek Choi, all of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Jun. 5, 1990, Ser. No. 533,494

Int. Cl.[5] H01G *4/06, 4/20*

U.S. Cl. 361—313 **14 Claims**



10. A folded capacitor for a DRAM cell having a MOS transistor and a capacitor, comprising:

a first capacitor including a first storage electrode, a first insulating layer and a first plate electrode, the first capacitor, the first storage electrode being extended from the upper part of a gate of a field oxide to the upper part of a gate of a channel region through a region for contact, the first insulating layer being interposed between the first storage electrode and the first plate electrode;

a second capacitor including the first plate electrode, a second insulating layer and a pad poly layer, the second capacitor being formed on the first capacitor, the second insulating layer being interposed between the first plate electrode and the pad poly layer; and

a third capacitor including a second storage electrode, a third insulating layer and second plate electrode, the third capacitor being formed on the second capacitor, the third insulating layer being interposed between the second storage electrode and the second plate electrode.

5,005,104

CLIP-CONNECTED TERMINAL CONDUCTOR ASSEMBLY

Kurt A. Grunert, Beaver, Pa.; Delfin Pabon, Carolina, Puerto Rico; and Ronald A. Cheski, Stowe Township, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 16, 1990, Ser. No. 568,375

Int. Cl.[5] H02B *1/20*

U.S. Cl. 361—355 **1 Claim**

1. A terminal assembly for connecting an electric cable to a bus conductor having a flat and square end portion with a central recess therein comprising:

a collar having an inner wall defining, between a head and a base portion thereof, a substantially central opening for accommodating therethrough the cable and the conductor end portion side-by-side in overlapping relation;

said central opening having a first section adjoining said head portion for receiving the cable and a second section adjoining said base portion for receiving the conductor end portion;

said second section forming an open channel communicating with said first section and of rectangular cross section matching the cross section of the conductor end portion; said open channel being defined by opposite lateral walls and by the inner surface of said, collar base portion joining said lateral walls, whereby the conductor end portion is lodged into said open channel for slip-fitting therein;

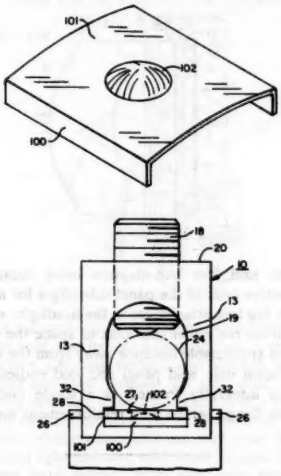
said collar head portion having a transversal threaded aperture with a locking screw extending therethrough for applying a perpendicular tightening force on the cable; and

clip means being provided including a resiliently curved metallic member symmetrically defined by parallel generatrices extending between opposite side edges from a front

end to a back end of the member; said opposite edges being distant by substantially the distance between said lateral walls so that said member side edges are guided by said lateral walls of said collar open channel;

a boss being provided centrally on said member, projecting on the convex side thereof and matching the end portion recess;

said member extending from front end to back end sufficiently, when lodged inside said second section, to ride



upon said collar base inner surface, and said member having ledges along said front and back edges for gripping the respective front and back sides of said collar base portion;

said member being placed within said open channel (a) upon said collar base inner surface for clipping thereupon and (b) below the conductor end portion for boss and recess mating under resilient cooperative pressure by said locking screw and said member.

5,005,105

STRESS-RELIEVING FLEXIBLE CIRCUIT BOARD HOLDER PLATE

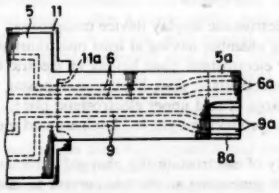
Norio Onodera, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Feb. 16, 1989, Ser. No. 311,928

Claims priority, application Japan, May 13, 1988, 63-63212[U]

Int. Cl.[5] H05K *1/00*

U.S. Cl. 361—398 **5 Claims**



1. A flexible print circuit board comprising a wired flexible insulation film held on a holder plate, a distributor section having a portion projecting from said insulation film, said distributor section including a cluster of conductive patterns arranged on said insulation film, wherein said holder plate is provided with a recessed portion under said distributor section, said recessed portion having a width greater than that of said cluster of conductive patterns.

5,005,106

MULTIFUNCTIONAL CARD HAVING AN ELECTROMAGNETIC WAVE PROTECTION

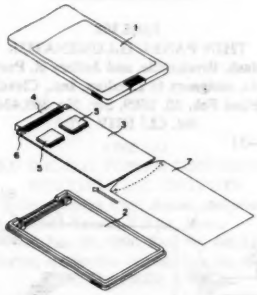
Yutaro Kiku, Yokohama, Japan, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 7, 1989, Ser. No. 447,394

Claims priority, application Japan, Dec. 8, 1988, 63-159956[U]

Int. Cl.[5] H05K *9/00*

U.S. Cl. 361—424 **1 Claim**



1. A multifunctional IC card comprising

a circuit substrate having mounted thereon at least one integrated circuit device and including a ground means,

a connector means disposed along at least one edge of said circuit substrate for electrically connecting the substrate to an external apparatus,

a housing of two separate sections formed of insulating material which are fit together to enclose the circuit substrate, and

a thin, film-like shielding member having two layers, an inner insulating layer and an outer conductive layer, said shielding member being disposed between the circuit substrate and the housing and surrounding said substrate, said inner insulating layer facing the substrate and said outer conductive layer facing the housing, said conductive layer being electrically connected to said ground means.

5,005,107

SOLID ELECTROLYTIC CAPACITOR

Yasuhiro Kobashi, Yahata, and Tsutomu Irikura, Joyo, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 6, 1989, Ser. No. 446,908

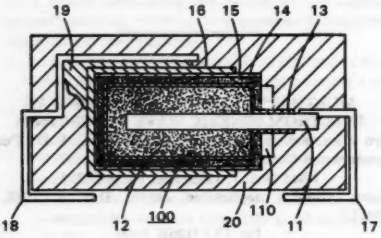
Claims priority, application Japan, Dec. 7, 1988, 63-309487; Apr. 5, 1989, 1-86240; Apr. 5, 1989, 1-86241; Apr. 5, 1989, 1-86242; Apr. 5, 1989, 1-86265; Apr. 5, 1989, 1-86266

Int. Cl.[5] H01G *9/00*

U.S. Cl. 361—540 **13 Claims**

1. A solid electrolytic capacitor comprising an electrode provided with an anode lead; a dielectric oxide film, a solid electrolyte layer, a carbon layer, and a cathode layer, which are successively formed on the surface of said electrode; a positive terminal connected to said anode lead; and a negative terminal connected to said cathode layer by means of an elec-

trically conductive adhesive; wherein at least one of said cathode layer and said electrically conductive adhesive comprises



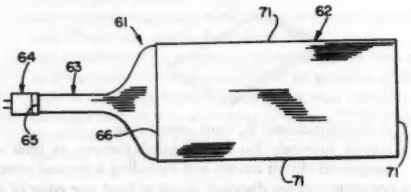
a polymer and an electrically conductive powder comprising a flaky palladium powder with grain diameters of 1–30 μm.

5,005,108

THIN PANEL ILLUMINATOR

David J. Pristash, Brecksville, and Jeffery R. Parker, Concord, both of Ohio, assignors to Lumitex, Inc., Cleveland, Ohio

Filed Feb. 10, 1989, Ser. No. 309,424
Int. Cl.[5] F21V *7/04*
U.S. Cl. 362—31 **76 Claims**



1. A panel illuminator comprising a solid transparent panel member having a greater cross sectional width than thickness and top and bottom surfaces and an input edge, transition means for receiving focused light from a light source and transmitting the focused light to said input edge for conduction by said panel member, and means for causing the conducted light to be emitted from one of said surfaces along the length of said panel member, said transition means including an input surface at one end shaped to permit a light source to be easily focused thereon, and an output surface at another end having a shape substantially corresponding in shape to said input edge of said panel member and connected thereto.

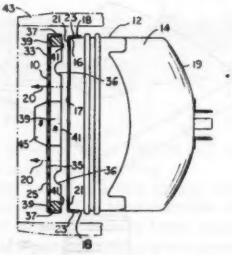
5,005,109

DETACHABLE AMBER LENS FOR A VEHICLE

Roland A. Carleton, 38241 Southfarm, Northville, Mich. 48167

Filed Jul. 30, 1990, Ser. No. 559,833
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 362—61 **3 Claims**

1. A removable fog lens attachment for a recessed automotive headlight, wherein the headlight includes a sealed beam unit having a rectangular front face and peripheral side surfaces extending generally normal to edge areas of said front face, and an annular rectangular mounting frame having an endless flat front flange overlying peripheral areas of the sealed beam unit front face, said mounting frame further including side flanges extending from outer edge areas of said front flange along the side surfaces of the sealed beam unit; said fog lens attachment comprising a flat rigid colored transparent light filtering panel having a rectangular plan configuration conforming to the plan configuration of the rectangular mounting frame; said transparent panel having an upper straight edge, a lower straight edge, and two straight side edges; said transparent panel having a flat front face, a rear face, and an endless peripheral flange extending right angularly from said rear face along the four edges of the panel; and four permanent magnets secured to the panel rear face at spaced points along the panel edges; each magnet being a straight bar magnet having a generally square cross section defining four flat faces; each bar magnet having a first flat face thereof engaged against the panel rear face, a second flat face thereof engaged against the panel peripheral flange, and a third flat face thereof in registry with the front flange of the mounting frame; said peripheral flange acting as a locator surface for the



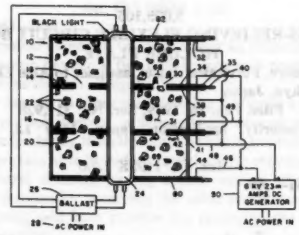
bar magnets; said four bar magnets being located midway along respective ones of the panel side edges for magnetically securing the fog lens attachment to the headlight; said magnets projecting from the panel rear face to space the rear face of said panel an appreciable distance away from the front face of the sealed beam unit; said panel and said endless peripheral flange being integrally formed as a single one piece unit whereby the flange serves as a reinforcement means for the panel.

5,005,110

ELECTROSTATIC DISPLAY DEVICE

Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081

Continuation-in-part of Ser. No. 475,910, Feb. 6, 1990, Pat. No. 4,842,504. This application Jul. 16, 1990, Ser. No. 553,866
The portion of the term of this patent subsequent to Jul. 17, 2007, has been disclaimed.
Int. Cl.[5] F21S *3/00*
U.S. Cl. 362—84 **5 Claims**



1. An electrostatic display device comprising:
a viewing chamber having at least one transparent side;
an upper electrostatic plate having an electric charge;
a lower electrostatic plate having an opposing charge from the charge of said upper electrostatic plate;
means for producing light to illuminate said viewing chamber;
a plurality of electrostatically charged particles; and
means for generating an electric current to said supper and lower electrostatic plates causing said particles to be attracted to the electrostatic plate of opposite charge of said particles, said particles acquiring the charge of such electrostatic plate to be then repelled and attracted to said electrostatic plate of opposing charge where said particles

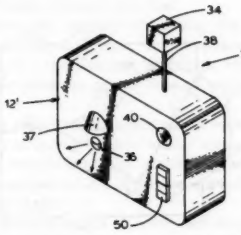
then change their charge to the same charge of that electrostatic plate where said particles are again repelled and attracted to the electrostatic plate of opposing charge, such process of changing charges continuing, causing the particles to move within said viewing chamber as said particles are illuminated by said light.

5,005,111

PURSE LIGHT ASSEMBLY

Chuck Teal, P.O. Box 1134, Walkertown, N.C. 27051

Filed Apr. 19, 1990, Ser. No. 511,234
Int. Cl.[5] A45C *15/06*
U.S. Cl. 362—156 **1 Claim**



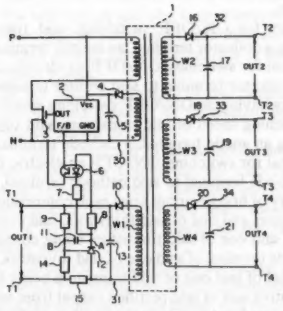
1. A light assembly for use in a purse comprising:
(A) a case, said case having a front surface, a rear surface, a top surface, a bottom surface, and two side surfaces;
(B) a hook-and-loop fastener on said case rear surface mounting said case to an inner surface of a purse;
(C) a light element mounted on said case front surface;
(D) a hood element mounted on said case front surface above said light element, said hood element being shaped to direct light emitted from said light element downwardly toward said case bottom surface;
(E) a power source in said case;
(F) a manual on/off switch mounted on said case front surface adjacent to said light element;
(G) a horn element mounted on said case front surface adjacent to said manual on/off switch;
(H) a first circuit means connecting said light element to said power source, said first circuit means including a reverse switch that is biased into a circuit closing closed condition and is opened by overcoming said bias, said reverse switch being connected to said power source and to said light element, said reverse switch connecting said light element and said horn element to said power source when said reverse switch is closed and disconnecting said light element and said horn element from said power source when said reverse switch is held open;
(I) a second circuit means connecting said horn to said reverse switch and to said power source, said second circuit means including
(1) a timer mechanism connected to said horn,
(2) said manual on/off switch connecting said timer mechanism and to said reverse switch,
(3) said timer mechanism connecting said horn to said reverse switch after a preset delay period after said reverse switch is closed, said manual on/off switch being connected between said timer mechanism and said horn to disconnect said horn from said power source when manually operated into an off condition whereby said manual on/off switch serves as a manual override to prevent said horn from being activated even after said preset time has elapsed if said manual on/off switch is in an off condition;
(4) said timer mechanism, said manual on/off switch and said horn all being connected in series with each other and said series connected timer mechanism, said manual on/off switch and said horn being connected in parallel with said light element with respect to said reverse switch so that said light element will be activated even if said manual on/off switch is in an off condition to disconnect said timer mechanism from said power source;
(J) a pedestal mounted at one end thereof on said case top surface and extending upwardly therefrom and having a second end located spaced from said case top surface; and
(K) a housing mounted on said pedestal second end, said reverse switch being located in said housing to be contacted by a mouth element of a purse to hold said reverse switch open when the purse is closed and to permit said reverse switch to close when the purse is opened.

5,005,112

REGULATED D.C.-D.C. POWER CONVERTER HAVING MULTIPLE D.C. OUTPUTS

Shigemi Kuriyama, Nagoya City, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 16, 1990, Ser. No. 465,812
Claims priority, application Japan, Jan. 26, 1989, 1-16965
Int. Cl.[5] H02M *3/335*
U.S. Cl. 363—21 **6 Claims**



1. A regulated D.C.-D.C. power converter having multiple D.C. outputs, comprising:
switching means for converting a D.C. input to a high-frequency power;
power conversion means for converting said high-frequency power into a plurality of D.C. output powers at a plurality of output terminals;
feedback means for monitoring the D.C. voltage at one of said plurality of output terminals and providing a feedback signal to said switching means when the monitored D.C. voltage deviates from a predetermined value to alter the operation of said switching means so as eliminate said deviation; and
hysteresis means for varying the value of said monitored D.C. voltage in accordance with the amount of load current drawn by a load connected to said one output terminal so as to cause a hysteresis change in the output D.C. voltage at said one output terminal in accordance with a change in said load current.

5,005,113

HYBRID CIRCUIT MODULE HAIVNG BRIDGE CIRCUIT AND RECTIFYING CIRCUIT DISPOSED ON A SAME SUBSTRATE

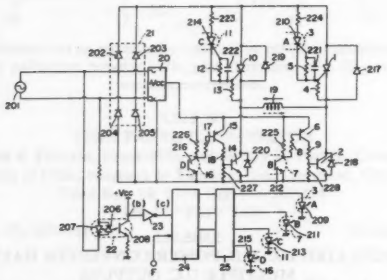
Nobuo Ohtuka, Oizumi, and Kouichi Matsumoto, Kumagaya, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Division of Ser. No. 271,302, Nov. 15, 1988, Pat. No. 4,918,590. This application Nov. 9, 1989, Ser. No. 433,773

Claims priority, application Japan, Nov. 16, 1987, 62-288779; Nov. 16, 1987, 62-288800

Int. Cl.[5] H02M *5/45, 5/458*

U.S. Cl. 363—37 1 Claim



1. A conversion apparatus having a bridge circuit using fast switching transistors for PWM and slow switching thyristors for a fundamental frequency and supplying to a load an output AC power having a frequency which is different from a frequency of an input AC power supplied thereto, said inverter comprising:

a rectifying circuit for rectifying a full wave of the input AC power and for providing a rectified output of pulsating power,

transistors for ON/OFF switching, said transistors each having a collector terminal, an emitter terminal and a base terminal for switching ON/OFF an electric current from said collector terminal to said emitter terminal,

thyristors having an ON/OFF switching speed slower than a switching speed of said transistors, said thyristors each having an anode terminal, a cathode terminal, and a gate terminal for switching ON/OFF an electric current from said anode terminal to said cathode terminal,

a plurality of bridge circuit arms each comprising one of said transistors and one of said thyristors, said collector terminal of said one of said transistors being connected to said cathode terminal of said one of said thyristors, said emitter terminal of said one of said transistors being connected to a negative side of said rectified output from said rectifying circuit, said anode terminal of said one of said thyristors being connected to a positive side of said rectified output from said rectifying circuit,

said plurality of bridge circuit arms being connected in parallel to each other to from the bridge circuit,

controlling means for supplying an electric signal to said gate terminal of said thyristors and for supplying an electric signal to said base terminal of said transistors so as to supply the AC output power to said load in accordance with a desired frequency, wherein said transistors repeatedly switch between ON and OFF states while said thyristors are in an ON state, and,

a zero cross signal generator for generating a zero cross signal at each half cycle of the input AC power supplied thereto,

said controlling means further comprising means for dividing a pulsating power during a period of time between said zero cross signal and a subsequent zero cross signal into plural power portions in accordance with the period of time, and means for changing a polarity of each of said plural power portions to said load in accordance with the desired frequency.

5,005,114

CIRCUITRY FOR GENERATING PHASE-SHIFTED SINUSOIDAL VOLTAGES

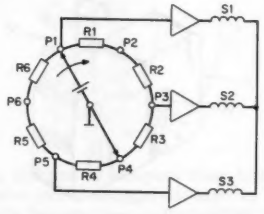
Güunter Gleim, Villingen-Schweaningen, Fed. Rep. of Germany, assignor to Deutsche Thomson-Brandt GmbH, VS-Villingen, Fed. Rep. of Germany

Filed Apr. 28, 1989, Ser. No. 345,020

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1988, 3814562

Int. Cl.[5] H02M *7/42;* H03B *27/00*

U.S. Cl. 363—43 6 Claims



1. An arrangement for generating phase-shifted sinusoidal voltages, comprising: a plurality of resistors connected in series in a closed circular network for providing said sinusoidal voltages; connecting junctions between resistors, each pair of connecting junctions having the same resistors therebetween; a source of direct-current voltage with poles; means for cyclically advancing a direct-current voltage from said source through said network so that two parallel branches of said network with the same number of resistors are connected between said poles of said voltage source, said resistors having all the same resistance values; motor windings connected between said connecting junctions; said voltage source being cyclically connected in sequence to said connecting junctions so that phase-shifted sinusoidal voltage functions appear at said connecting junctions for operating a motor.

5,005,115

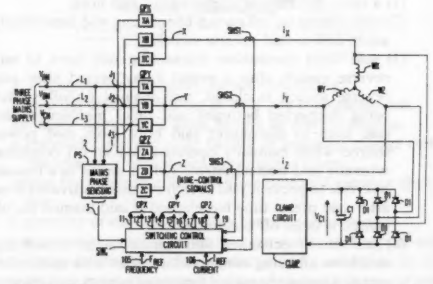
FORCED-COMMUTATED CURRENT-SOURCE CONVERTER AND AC MOTOR DRIVE USING THE SAME

Colin D. Schauder, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 28, 1989, Ser. No. 386,067

Int. Cl.[5] H02M *5/257*

U.S. Cl. 363—159 11 Claims



1. An AC/AC converter, connected between AC input lines and AC output lines, said input lines being connected to a power supply and said output lines being connected to a load,

and including a plurality of bilateral switches connected in groups, each group being associated in common with one of the respective AC output lines and the bilateral switches in each group being associated with the AC input lines, respectively, each bilateral switch when turned ON connecting one AC line associated therewith to one AC output line common with the group, comprising:

first means for successively selecting in sequence said groups by pairs, each pair of group for a predetermined duration to establish a single current path through the load, said current being for said duration in one direction through one selected group of said pair and in the opposite direction through the other selected group of said pair, said sequence and duration determining the frequency of alternation of said current in the load;

second means for successively gating for conduction in relation to the AC input line voltages said bilateral switches of a selected pair of groups for establishing a voltage between the output lines of said selected pair of groups;

means being associated with said gating means for adjusting the phase of gating relative to the voltage of said input lines for controlling said establishing voltage and for establishing therewith a desired magnitude of current on said output lines;

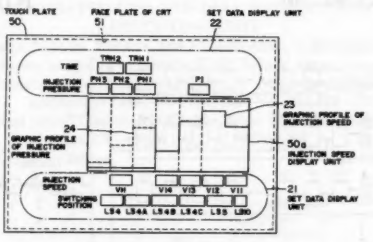
whereby a current source of controlled magnitude and frequency is applied to said output AC load lines.

5,005,116

APPARATUS FOR DISPLAYING A PROFILE AND CORRESPONDING DATA OF OPERATING CONDITIONS

Shigeru Fujita; Hideo Tanaka, and Susumu Harada, all of Numazu, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 4, 1988, Ser. No. 267,254
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—188 **4 Claims**



1. An input display apparatus including:

a display member adapted to display a plurality of set items,

a transparent panel including key elements and being superposed on said display member,

a profile controlled graphic profile display picture displaying a profile and corresponding data representing an operating condition during one operation step of an injection molding machine in multi-stages in accordance with an operation position of a screw, and

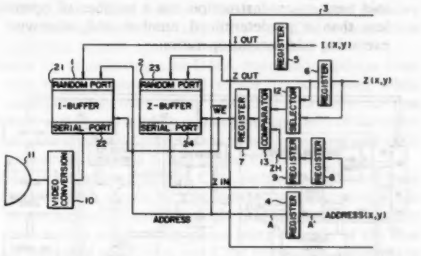
means for changing a level of said profile display picture in accordance with a magnitude of a changed corresponding data value when an operating condition of said injection molding machine is changed, wherein an input key frame is displayed in a superposed relation on said displayed picture only when a set item is selected and operated for inputting a set value, said input key frame comprising a ten key and an input data display unit.

5,005,117

THREE-DIMENSIONAL COMPUTER GRAPHICS APPARATUS WITH TWO-PORT MEMORY FOR STORING DEPTH INFORMATION

Nobuyuki Ikumi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 29, 1988, Ser. No. 251,164
Int. Cl.[5] G06F *3/153, 15/70;* G09G *1/16*
U.S. Cl. 364—200 **1 Claim**



1. A three-dimensional computer graphics apparatus in which depth information, brightness information, and memory addresses of a plurality of coordinate points on a screen of the apparatus are calculated by an integrated circuit, wherein the depth information and the brightness information are stored in respective depth information display and brightness information display buffers in accordance with the memory addresses, said integrated circuit comprising:

depth information storing means for storing the calculated depth information of the coordinate points;

register means for storing depth information for a first of said plurality of coordinate points;

selecting means for selecting the depth information in said register for said first of said plurality of coordinate points and for selecting the calculated depth information in said storing means serially for all but the first of said plurality of coordinate points;

delay means for delaying transfer of the calculated depth information of said plurality of coordinate points for a predetermined period of time;

comparing means, connected to said selecting means and to said delay means, for comparing the calculated depth information selected by said selecting means with the depth information delayed by said delay means, and for activating a write-in control signal on the basis of the comparison; and

said depth information display buffer including a two-port memory means for storing the depth information in accordance with the write-in control signal, said two-port memory means including a random port through which the calculated depth information stored in the depth information storing means is entered, and including a serial port through which the calculated depth information is supplied to said delay means.

5,005,118

METHOD AND APPARATUS FOR MODIFYING MICRO-INSTRUCTIONS USING A MACRO-INSTRUCTION PIPELINE

Daniel E. Lenoski, Mountain View, Calif., assignor to Tandem Computers Incorporated, Cupertino, Calif.

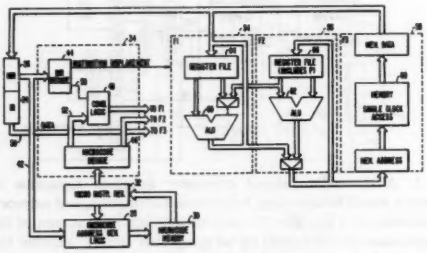
Filed Apr. 10, 1987, Ser. No. 36,726
Int. Cl.[5] G06F *9/26, 9/302, 9/305, 9/38*
U.S. Cl. 364—200 **1 Claim**

1. An apparatus for executing instructions in a controller having at least first and second function units which each include an arithmetic logic unit, comprising:

a macro-instruction register;

a next macro-instruction register coupled to said macro-instruction register;

first logic means, coupled to one of said instruction registers, for generating control signals to concurrently execute, during a single clock cycle, first and second operations in said first and second function units, respectively, said first operation being used to carry out a first macro-instruction in said first macro-instruction register and said second operation being performed to carry out a next macro-instruction, and for using the result of said second operation during the execution of said next macro-instruction if said next macro-instruction has a number of operations less than a predetermined number and otherwise re-executing said second operation;



second logic means for decoding said next macro-instruction to determine whether less than said predetermined number of operations are required;

wherein one of said first and second operations is a memory access operation and said first logic means includes

a first logic stage for providing access to a memory,

a second logic stage having a first arithmetic logic unit for performing arithmetic operations on data provided from at least one of said first and next macro-instructions and said memory, and

a third logic stage having a second arithmetic logic unit for performing arithmetic operations on data provided from at least one of said first and next macro-instructions and said memory, at least two of said first, second and third logic stages being concurrently operated for a portion of said first and next macro-instructions.

5,005,119

USER INTERACTIVE CONTROL OF COMPUTER PROGRAMS AND CORRESPONDING VERSIONS OF INPUT/OUTPUT DATA FLOW

James E. Rumbaugh, Schenectady, N.Y., and Kenneth J. Daniel, North Ridgeville, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 20,846, Mar. 2, 1987, abandoned. This application Aug. 29, 1989, Ser. No. 401,461

Int. Cl.[5] G06F *15/00, 3/14*

U.S. Cl. 364—200 **22 Claims**

1. A method of for tracking program execution and versions on a digital computer during a computeraided engineering design operation, said computer including means for interacting with a human user and memory means for storing programs and data, said method comprising the steps of:

a) identifying on the digital computer each program to be controlled;

b) identifying for each said program input and output data set requirements;

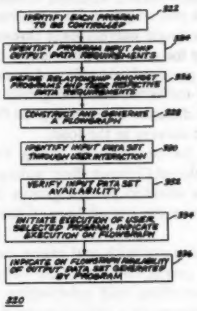
c) defining a relationship amongst said programs and their respective input and output data set requirements;

d) identifying an input data folder and an output data folder for respectively representing said input and output data set requirements for each said program;

e) identifying through user interaction each said user selected input data set;

f) verifying the presence of each said user selected input data set in each said input data folder of each said user selected program;

g) issuing computer commands effective to execute each said user selected program on each said user selected input data set, each said user selected program generating an output data set upon completing execution;



h) placing each said output data set generated by each said user selected program into said output data folder thereof; and

i) automatically identifying for each said output data set a respective input data set which was utilized to generate said output data set, thereby tracking design versions resulting from said computeraided engineering design operation.

5,005,120

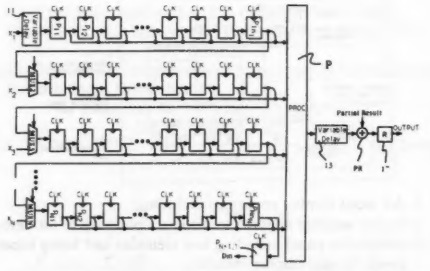
COMPENSATING TIME DELAY IN FILTERING SIGNALS OF MULTI-DIMENSIONAL RECONVIGURABLE ARRAY PROCESSORS

Peter A. Ruetz, Redwood City, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Jul. 29, 1988, Ser. No. 226,026

Int. Cl.[5] G06F *3/05, 13/29, 13/372, 15/16*

U.S. Cl. 364—200 **10 Claims**



1. A reconfigurable signal processing module comprising:

a first module input port (X.1) for receiving a first digital signal stream ($A.1=a_{1,1}\ a_{1,2}\ \ldots\ a_{1,n.1}$) having sequential data components ($a_{1,1}\ a_{1,2}\ \ldots\ a_{1,n.1}$) representing a first number $n.1>1$ of sample values;

a second module input port (X.2) for receiving a second digital signal stream ($A.2=a_{2,1}\ a_{2,2}\ \ldots\ a_{2,n.2}$) having sequential data components ($a_{2,1}\ a_{2,2}\ \ldots\ a_{2,n.2}$) representing a second number $n.2>1$ of sample values;

a first chain of register means ($P_{1,1}\ P_{1,2}\ \ldots\ P_{1,n.1}$), having a first end coupled to the first module input port (X.1), for receiving and storing the data components ($a_{1,1}\ a_{1,2}\ \ldots\ a_{1,n.1}$) of the first digital signal stream (A.1) and for out-

putting predesignated stored ones of said data components ($a_{1,1}$ $a_{1,2}$ . . . $a_{1,n.1}$) in parallel onto a corresponding number of first-chain tap lines;

first multiplexer means, having first and second selectable multiplexer input ports and a first multiplexer output port, for outputting signals appearing on a selected one of the first and second multiplexer input ports, the first multiplexer input port being coupled to a preselected one or more of the first-chain tap lines and the second multiplexer input port being coupled to the second module input port (X.2);

a second chain of register means ($P_{2,1}$ $P_{2,2}$ . . . $P_{2,n.2}$), having a first end coupled to the first multiplexer output port, for receiving and storing, during a first mode of the first multiplexer means, each of the data components ($a_{2,1}$ $a_{2,2}$ . . . $a_{2,n.2}$) of the second digital signal stream (A.2) and for outputting predesignated ones of said data components ($a_{2,1}$ $a_{2,2}$ . . . $a_{2,n.2}$) in parallel onto a corresponding number of second-chain tap lines, the second chain of register means being further for receiving and storing, during a second mode of the first multiplexer means, a plurality of first-chain-stored data components transmitted from the preselected one or more first-chain tap lines and for outputting predesignated ones of said first-chain-stored data components in parallel onto a corresponding number of second-chain tap lines, the first mode of the first multiplexer means being one in which the first multiplexer input port is coupled to the first multiplexer output port, the second mode of the first multiplexer means being one in which the second multiplexer input port is coupled to the first multiplexer output port; and

function generating means, having function input lines coupled to predetermined ones of the first-chain and second-chain tap lines, for receiving as input parameter signals of a predetermined signal processing function, preselected ones of the shifted data components ($a_{1,1}$, $a_{1,2}$, . . . , $a_{1,n.1}$ and $a_{2,1}$, $a_{2,2}$, . . . $a_{2,n.2}$) and for outputting on a function output bus of the function generating means, a digital function signal which is produced according to said signal processing function.

5,005,121

INTEGRATED CPU AND DMA WITH SHARED EXECUTING UNIT

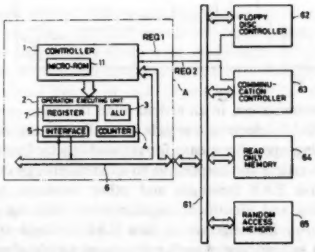
Kunihiko Nakada, Kodaira, and Yasushi Akao, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 836,421, Mar. 5, 1986, abandoned. This application Mar. 20, 1989, Ser. No. 326,472

Claims priority, application Japan, Mar. 25, 1985, 60-58350

Int. Cl.[5] **G06F** *9/22, 15/78, 12/00*

U.S. Cl. 364—200 **29 Claims**



1. A monolithic integrated single device data processor controller, comprising:

a CPU;

A DMA controller;

memory means for storing in a plurality of addressable memory locations, a plurality of CPU and DMA instructions for individually, respectively, controlling the operation of the CPU and the DMA controller;

holding means for simultaneously holding DMA and CPU instruction addresses of selected ones of said memory locations;

a single operation execution unit for executing at different times both said CPU and DMA instructions stored in said selected ones of said memory locations;

means for addressing said memory means in a variable sequence with said CPU and DMA instruction addresses held by said holding means for transferring said CPU and DMA instructions from said selected ones of said memory locations addressed by said CPU and DMA instruction addresses to said operation execution unit;

means for transferring said DMA instruction address from said holding means to said means for addressing while simultaneously maintaining said CPU instruction address held within said holding means independently of the order of arrival of said DMA instruction address and said CPU instruction address in said means for holding; and

means for transferring said CPU instruction address from said holding means to said means for addressing while simultaneously maintaining said DMA instruction address held within said holding means independently of the time of arrival of said DMA and CPU instruction addresses in said holding means.

5,005,122

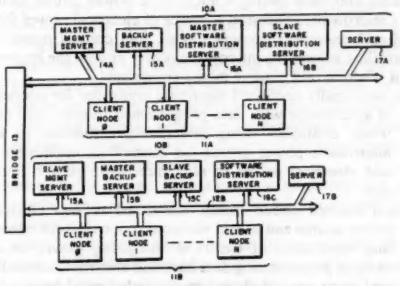
ARRANGEMENT WITH COOPERATING MANAGEMENT SERVER NODE AND NETWORK SERVICE NODE

David Griffin, Maynard; Jonathan Campbell, Acton; Michael Reilly, Sterling, and Richard Rosenbaum, Pepperell, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Sep. 8, 1987, Ser. No. 94,169

Int. Cl.[5] **G06F** *9/44, 13/38*

U.S. Cl. 364—200 **11 Claims**



1. A network including a client node and a plurality of server nodes interconnected by a communications link, at least one of said server nodes comprising a management server node and at least another one of said server nodes comprising a network service node for performing a network service with respect to said client node,

A. said management server node including:

i. a network service initiator arranged to transmit a network service initiation message for initiating a network service with respect to said client node;

ii. a network status maintainer arranged to receive a status message from said communications link and to maintain the status of said network service in response thereto; and

iii. a management server controller connected to said network service initiator and said network status maintainer and arranged to control the network service initiator to initiate said network service in response to the received status messages;

B. said network service node including:

i. a network service operator arranged to perform said network service with respect to said client node;

ii. a network service enabler connected to said communications link and said network service operator and arranged to receive the network service initiation message from said communications link and to enable said network service operator to operate in response to the receipt of said network service initiation message; and

iii. a status message generator connected to said communications link and to said network service operator and arranged to generate said status message identifying the status of an operation performed by said network service operator and to transmit said status message over said communications link.

5,005,123

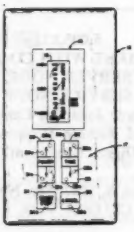
CONTROL SYSTEM FOR MICROWAVE COOKING APPLIANCE

Eugene P. Mierzwinski, Ft. Wayne, Ind., assignor to Hamilton Standard Controls, Inc., Farmington, Conn.

Filed Nov. 19, 1985, Ser. No. 799,715

Int. Cl.[5] H05B *9/06*

U.S. Cl. 364—400 **12 Claims**



1. An improved apparatus for the control of a microwave cooking appliance having a microwave power circuit including a microwave generator, a source of electrical power for at least said microwave power circuit, and control means for controlling at least the microwave power circuit, the improvement wherein said control means comprises:

an electrically-energized electronic controller for operating in accordance with data programmed therein, said electronic controller being operatively connected to said microwave power circuit for controlling application of said electrical power to said microwave power circuit; and

input control circuit means connected to said electrical power source and to said electronic controller for controlling application of electrical energizing power to and entry of programming data into, said electronic controller, said input control circuit means including at least a data entry key for controlling the programming of data into said electronic controller, said input control circuit means being further operative in response to an initial actuation of said data entry key for applying start-up energizing power to said electronic controller.

5,005,124

METHOD AND APPARATUS FOR CATEGORIZING AND CERTIFYING MAIL

Richard A. Connell, South Salem; Raymond Kesting, Purdys, both of N.Y.; Ronald P. Sansone, Weston, and Karl H. Schumacher, Westport, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Aug. 23, 1988, Ser. No. 234,977

Int. Cl.[5] G06F *15/21*

U.S. Cl. 364—401 **34 Claims**

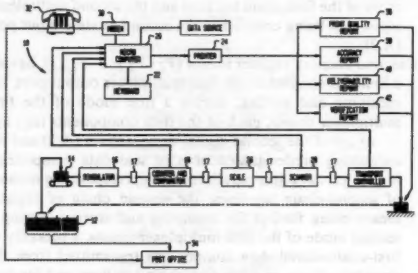
9. Apparatus for certifying and categorizing a batch of mail, comprising:

means for obtaining a random statistical sample of mail pieces from a batch of mail pieces,

means for storing post office regulations with regard to acceptable mail sizes, weight and address readability,

means for individually transporting the sample mail pieces,

means for identifying each sample mail piece,



means for scanning the sample mail pieces to determine the size and readability of the address line on each sample mail piece,

means for comparing the obtained weight, size and readability of the sample mail pieces with the stored regulations, and

means for determining the number of sample mail pieces that do not conform with the stored regulations.

5,005,125

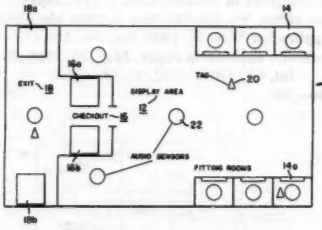
SURVEILLANCE, PRICING AND INVENTORY SYSTEM

James G. Farrar, Boca Raton, and Ezra D. Eskandry, Miami, both of Fla., assignors to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

Filed Feb. 28, 1986, Ser. No. 834,766

Int. Cl.[5] G08B *13/18*

U.S. Cl. 364—403 **9 Claims**



1. In combination, in an article retail facility:

(a) an EAS (electronic article surveillance) tag of type including openable means for releasable attachment thereof to an article and responsive to incident energy comprising diverse EAS messages and other messages related to pricing and identification of articles, said tag including circuitry for response to such EAS message and for receipt and storage of such pricing and article identification data and for response to a selective one of said EAS messages and the opening of such releasable attachment means for issuance of said pricing and article identification data; and

(b) message generator means for transmitting such EAS and other messages in the form of said incident energy.

5,005,126

SYSTEM AND METHOD FOR REMOTE PRESENTATION OF DIAGNOSTIC IMAGE INFORMATION

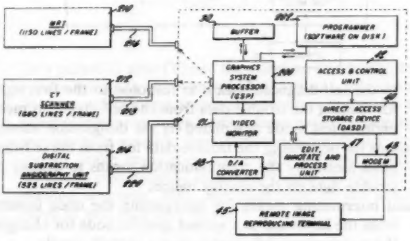
Marvin E. Haskin, Philadelphia, Pa., assignor to Prevail, Inc., West Chester, Pa.

Continuation of Ser. No. 84,333, Aug. 11, 1987, Pat. No. 4,764,870, and a continuation-in-part of Ser. No. 36,264, Apr. 9, 1987, abandoned. This application May 31, 1988, Ser. No. 200,543

The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.

Int. Cl.[5] G06F *15/42*

U.S. Cl. 364—413.13 3 Claims



1. In a system for providing viewing of diagnostic images of an object at a location remote from the object, comprising:

irradiating means for applying diagnostic radiation fields to said object at a diagnostic site;

radiation sensing means positioned adjacent said site and responsive to changes in said fields produced by said object for producing first object-related analog video signals embodying diagnostic information as to said object, in a first format;

signal-supplying means provided with said analog video signals of said first format;

diagnostic-image forming means adjacent said site, supplied with said analog video signals of said first format by said signal-supplying means, said diagnostic image-forming means being responsive thereto to form a visually-perceptible visual image of said object suitable for diagnostic review; and

a remote display terminal adapted to receive analog video signals in a standard television format differing from said first format and to produce therefrom a corresponding image;

the improvement comprising:

signal pick-off means at said site for directly capturing said first analog video signals of said first format from said signal supply means prior to its application to said diagnostic image-forming means, and for converting them to said standard television format; and

transmitter means for transmitting said converted signals to said remote display terminal for display of said image thereon.

5,005,127

SYSTEM INCLUDING MEANS TO TRANSLATE ONLY SELECTED PORTIONS OF AN INPUT SENTENCE AND MEANS TO TRANSLATE SELECTED PORTIONS ACCORDING TO DISTINCT RULES

Shuzo Kugimiya; Yoji Fukumochi; Ichiko Nakamura, all of Nara; Tokuyuki Hirai, Yamatokoriyama, and Hitoshi Suzuki, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 25, 1988, Ser. No. 262,313

Claims priority, application Japan, Oct. 26, 1987, 62-271287; Oct. 28, 1987, 62-272638

Int. Cl.[5] G06F *15/38*

U.S. Cl. 364—419 2 Claims

INPUT [It is developped in {{the Temperature and Pressure Test, Section 37}}.

OUTPUT それは、the Temperature and Pressure Test, Section 37 で開発される。

1. A machine translation apparatus for inputting source language of words or sentences to be translated to a target language comprising:

a morpheme analyzer having a dictionary for analyzing a source sentence into morphemes and for obtaining part of speech and other information using said dictionary;

a syntax analyzer having grammatical rules for analyzing the structure of the morphemes identified by said morpheme analyzer using said dictionary and grammatical rules;

a converter for converting the structure obtained by said syntax analyzer to a structure of the target language;

a translated sentence generator for generating a translated sentence according to the structure of the target language obtained by said converter;

marker entry means for entering a no-conversion start marker and a no-conversion end marker in said input sentence;

marker identification means for identifying whether or not data read is either one of said no-conversion start marker and said no-conversion end marker;

morpheme skip means for skipping, when said marker identification means identifies the data read to be a no-conversion start marker, the dictionary referencing for all morphemes between the no-conversion start and end markers;

morpheme storing means for storing said morphemes between said no-conversion start and end markers, and adding data identifying said morphemes as a noun compound during dictionary look-up processing of said morpheme analyzer;

generation skip means for skipping translation generation for all morphemes between the no-conversion start and end markers, when said marker identification means identifies the read data to be a no-conversion start marker;

translation generation storing means for storing said morphemes in the same form as they appear in the source language during a translation generation processing in said translated sentence generator; and

means for setting a flag as the noun compound in a buffer.

5,005,128

AUTOMATED VEHICLE CONTROL

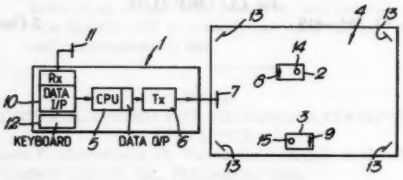
Michael P. Robins, Rugby, and Malcolm T. Roberts, Oadby, both of England, assignors to The General Electric Company, p.l.c., England

Filed May 2, 1989, Ser. No. 346,129

Claims priority, application United Kingdom, May 13, 1988, 8811442

Int. Cl.[5] G06F 15/50

U.S. Cl. 364—424.02 5 Claims



1. A method of operating a vehicle guidance and control system including

(a) a vehicle having motive power and steering, a navigation system, and means for transmitting a directional laser beam which is scanned in a predetermined sense;

(b) a plurality of reflectors spaced apart from one another, each reflector incorporating an optical code which identifies that reflector, and each reflector being operative to reflect light from said laser beam when said beam impinges thereon; and

(c) means for utilizing said light reflected back to the vehicle by at least two said reflectors for controlling the movement and heading of the vehicle,

said method comprising the steps of:

(i) notionally dividing an area in which the vehicle is to freely operate into a plurality of equal subareas of predetermined dimension, each sub-area being provided with a plurality of said reflectors;

(ii) positioning the vehicle at an initial location from which its laser beam can scan a plurality of initialization reflectors, each incorporating a unique optical code, the initialization reflectors being located at positions selected for initialization of said navigation system;

(iii) feeding to said navigation system data defining the positions of said initialization reflectors; and

(iv) causing the navigation system to determine the position of the vehicle with respect to said initialization reflectors,

whereby, during subsequent movement of the vehicle around the area, the navigation system is operative, by measurement of distances and directions traveled by the vehicle from said initial location, to determine in which sub-area the vehicle is located at any instant.

5,005,129

DIAGNOSIS SYSTEM FOR A MOTOR VEHICLE

Kunihiro Abe, Higashi-Murayama; Masanori Sakamoto, Nishitama, and Tomoya Kobayashi, Fuchi, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1989, Ser. No. 314,647

Claims priority, application Japan, Feb. 29, 1988, 63-046331

Int. Cl.[5] G01M 15/00; F02D 41/26; F02P 17/00

U.S. Cl. 364—424.03 3 Claims

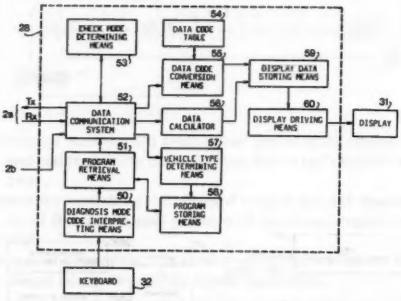
1. A diagnosis system for diagnosing an electronic control system for a vehicle, the electronic control system comprising sensing means for detecting operation conditions of the vehicle, and a first control unit responsive to the operation conditions for providing control signals for controlling the vehicle, the diagnosis system comprising a diagnosis device with a keyboard for inputting a code, a second control unit responsive to the code for diagnosing the electronic control system, display means for displaying diagnosis data diagnosed by the second control unit, and connecting means electrically connecting the diagnosis device to the electronic control system,

said first control unit comprising a programmed control system comprising self-diagnosis means for checking trouble in the electronic control system and for storing the trouble as trouble data and designation means for designating one of a plurality of test modes for the trouble data to said self-diagnosis means;

said second control unit comprising a programmed control system comprising:

interpreting means for interpreting the code inputted from the keyboard as a first specific code for checking the trouble data and for producing a first signal;

communication means for applying a first command signal



to the self-diagnosis means in response to the first signal for feeding the trouble data from the self-diagnosis means under a test mode designated by the designation means;

means for processing the trouble data fed from the self-diagnosis means by the communication means to display the trouble data on the display means;

said interpreting means for interpreting the code inputted from the keyboard as a second specific code for changing the test mode and for producing a second signal;

said communication means being responsive to the second signal for applying a second command signal to the designation means; and

said designation means being responsive to the second command signal for changing the test mode of the self-diagnosis means.

5,005,130

TRAILER SWING CONTROL

Michael T. Breen, Garden City, and Jeffrey H. Skorupski, Brighton, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 20, 1989, Ser. No. 454,095

Int. Cl.[5] G06F 7/70, 15/48; B06T 13/00, 8/74

U.S. Cl. 364—426.01 12 Claims

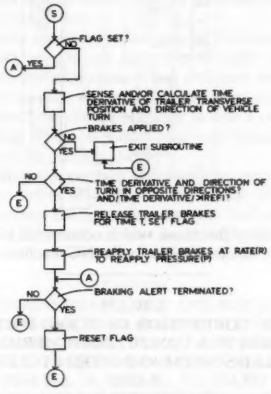
1. A trailer anti-swing brake control method for articulated vehicles (10) of the type comprising a tractor (12) and a trailer (14) connected at an articulating connection (34/176) defining a pivot axis (176) about which the trailer is pivotable relative to the tractor, a tractor brake system, a trailer brake system, a driver operated brake effort demand device (76/78) for providing a demand input signal indicative of the magnitude of operators demand for vehicle braking, trailer brake control means (174) responsive in at least one operating mode for causing the trailer brake system to be applied with an operating force generally proportional to the magnitude of said demand input signal, said control method characterized by:

sensing (260) and/or calculating a value indicative of trailer transverse movement and of a time derivative thereof and providing at least one input signal indicative thereof;

receiving and processing said input signals (70) according to predetermined logic rules to detect the existence of condi-

tions indicative of at least one of incipient and initial trailer brake induced trailer swing events and generating command output signals in response to detection of the existence of said conditions; and

responding (174) by said control means to said command output signals by causing the trailer brake system brakes to be applied with a substantially reduced force (210–212) regardless of the magnitude of said demand input signal



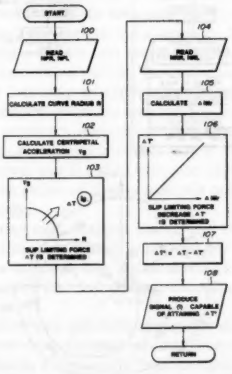
for a period of time (T) and then causing said trailer brake system brakes to be reapplied (214–216) at a selected rate (R) to a selected maximum reapplication force (P), said selected maximum reapplication force having a magnitude considerably smaller than the maximum trailer brake system brake application force (208–210), said selected maximum reapplication force (P) being a function of, and varying inversely with, the magnitude of the absolute value of said time derivative.

5,005,131

SLIP CONTROL DEVICE FOR DIFFERENTIAL

Takashi Imaseki, and Yuji Kobari, both of Zushi, Japan, assignors to Nissan Motor Co., Ltd., Yokahama, Japan

Filed Sep. 21, 1988, Ser. No. 247,466
Claims priority, application Japan, Sep. 29, 1987, 62-245685
Int. Cl.[5] B60T *8/32*
U.S. Cl. 364—426.02 **3 Claims**



1. A method of controlling a slip of a differential for a wheeled vehicle, the differential being of the type incorporating a clutch variable in engagement for producing a slip limiting force for limiting a differential action even during cornering of the vehicle, the method comprising:

detecting a driving wheel slip during cornering of the vehicle;

reducing a force urging the clutch for engagement and thereby reducing the slip limiting force in proportion to an increase of the driving wheel slip, wherein said detecting comprises the steps of:

detecting rotation speeds of a set of front dirigible wheels;

calculating a curve radius of the cornering vehicle by using the rotation speeds of the front dirigible wheels;

calculating a centripetal acceleration of the cornering vehicle by using the rotation speeds of the front dirigible wheels;

determining a basic slip limiting force based on the curve radius and the centripetal acceleration of the cornering vehicle and on a predetermined map;

detecting rotation speeds of a set of rear driving wheels; and

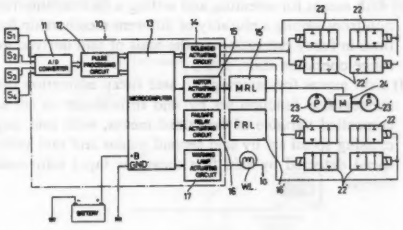
calculating the driving wheel slip by using an average front wheel speed and an average rear wheel speed.

5,005,132

ANTILOCK BRAKE CONTROL DEVICE

Masato Yoshino, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 20, 1989, Ser. No. 438,006
Int. Cl.[5] B60T *8/58*
U.S. Cl. 364—426.02 **4 Claims**



1. An antilock brake control device for use in a full-time four-wheel drive motor vehicle, comprising: wheel rotation sensors for detecting the wheel rotations of the wheels of the vehicle; an electronic control circuit for calculating the wheel speeds, the estimated vehicle speed and the decelerations and the slip rates of the wheels from the wheel rotation signals detected and for producing fluid pressure control signals on the basis of the results of said calculation, and a fluid pressure control unit for controlling the braking forces on the wheels independently of one another in response to said fluid pressure control signals, said electronic control circuit having means for calculating the coefficient of friction μ between the wheels and the road surface based on the calculated vehicle deceleration and the sum of slip rates SR of both rear wheels based on a predetermined formula using the speeds of both rear wheels and a reference vehicle speed as the parameters to control all the wheels independently of one another if said coefficient of friction μ is higher than a first predetermined value μ_0 and said sum of slip rates SR is smaller than a second predetermined value THR and to control the front wheels independently of each other and control the rear wheels based on the wheel rotation signal supplied from the wheel rotation sensor for one of the rear wheels rotating at a lower speed than the other, if said sum of slip rates SR is larger than said second predetermined value THR.

5,005,133

SYSTEM AND METHOD FOR AUTOMATICALLY CONTROLLING A VEHICLE SPEED TO A DESIRED CRUISING SPEED

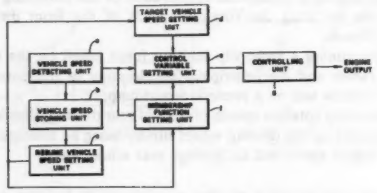
Hiroshi Takahashi, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 12, 1988, Ser. No. 143,092

Claims priority, application Japan, Jan. 12, 1987, 62-3299; Jan. 14, 1987, 62-5000

Int. Cl.[5] B60K *31/00*

U.S. Cl. 364—426.04 34 Claims



2. A system for automatically controlling a vehicle speed to a target cruising speed, having an automatic cruising speed control mode comprising:

(a) first means for detecting vehicle speed;

(b) second means for setting said target cruising speed on the basis of a vehicle driver'intention;

(c) third means for controlling an engine output using a controlled variable so that said vehicle speed detected by said first means coincides with said target cruising speed;

(d) fourth means for deriving a gear range operation state of a vehicular transmission connected to the engine;

(e) fifth means for selecting and setting a membership function from among a plurality of different membership functions in fuzzy estimation on the basis of said derived gear range operation state; and

(f) sixth means for carrying out said fuzzy estimation using membership function set by said fifth means to set said controlled variable of said third means, with said target cruising speed set by said second means and said vehicle speed detected by said first means as input information thereof.

5,005,134

NUMERICAL CONTROL APPARATUS WITH SIMULTANEOUS FUNCTION EXECUTION

Yoshihiro Nakashima, Machida, and Yasunori Kinoshita, Kunitachi, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP88/00409, § 371 Date Nov. 9, 1988, § 102(e) Date Nov. 9, 1988, PCT Pub. No. WO88/08559, PCT Pub. Date Nov. 3, 1988

PCT Filed Apr. 26, 1988, Ser. No. 274,149

Claims priority, application Japan, Apr. 30, 1987, 62-107257

Int. Cl.[5] G05B *19/403*

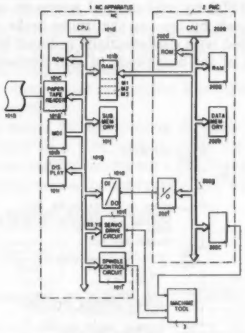
U.S. Cl. 364—474.01 4 Claims

1. A numerical control apparatus for sequentially controlling an NC machine tool in accordance with a stored-program method by using a sequence program and a program that has been read in, comprising:

memory means for simultaneously storing a plurality of auxiliary function codes which command the NC machine tool to perform specific auxiliary functions, from the program that has been read in;

execution means for simultaneously executing function instructions identifying auxiliary function numbers corresponding to each of the auxiliary function codes stored in said memory means to carry out the auxiliary functions; and

updating means for updating all of the auxiliary function codes of said memory means in response to completion of



the auxiliary functions, which correspond to each of the auxiliary function codes, in the NC machine tool.

5,005,135

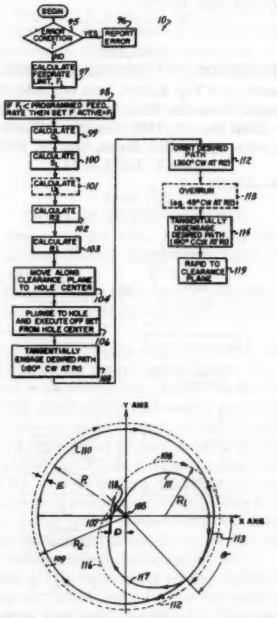
DYNAMIC CORRECTION OF SERVO FOLLOWING ERRORS IN A COMPUTER-NUMERICALLY CONTROLLED SYSTEM AND FIXED CYCLE UTILIZING SAME

Alfred H. Morser; Walter M. Gildemeister, both of Cincinnati, and David M. Farmer, Loveland, all of Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Mar. 22, 1989, Ser. No. 327,324

Int. Cl.[5] G05B *19/24*

U.S. Cl. 364—474.35 57 Claims



1. A method of correcting path radius errors in a computer numerically controlled system of the type adapted to receive

program instructions defining a desired path of relative movement to be effected between a workpiece and a tool by motion of machine members along at least two orthogonal linear axes at a feedrate, (F) under control of a servo which receives position commands based on said instructions, said servo having at least one of, a position loop gain, (K_v) and a velocity loop integral time, (T_i), said path including a curved portion to be executed by effecting coordinated linear movement along said axes, said method comprising the steps of:

(a) receiving an instruction defining a desired radius, (R) of said curved portion;

(b) generating corrected radius data, (R2) to compensate for servo following errors appearing as path radius errors along said curved portion of said path such that the difference between the desired radius, (R) and said corrected radius data, (R2) compensates for at least a portion of the path radius error that would otherwise be induced in the movement by the servo, and

(c) generating the position commands in response to said corrected radius data whereby the actual relative movement between the workpiece and the tool more closely follows said curved portion of said desired path.

5,005,136

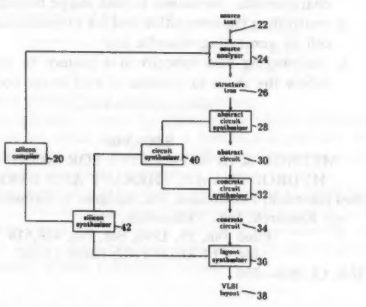
SILICON-COMPILER METHOD AND ARRANGEMENT

Cornelis H. Van Berkel, Heeze; Ronald W. J. J. Saeijs, Eindhoven, and Cornelis Niessen, Geldrop, all of Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Feb. 16, 1988, Ser. No. 156,392

Int. Cl.[5] G06F *15/60*

U.S. Cl. 364—490 **13 Claims**



1. A silicon-compiler method for executing a silicon-compiler program comprising the following sequence of steps:

a. a source-analyzer step having a sequence of substeps for:

a1. receiving a source text expressing an algorithm in a first imperative concurrent computer language having concepts including an explicit parallelism construct, an explicit sequentialism construct and an explicit communication construct, said communication construct stipulating a communication action that is represented as a time interval and is either active or passive for execution on the active or passive side of a program channel, respectively;

a2. converting said received source text under execution of lexical analysis, syntactic analysis and semantic analyis into a structure-tree (as an abstract) representation of the source text and defined according to said concepts;

b. an abstract-circuit synthesizer step for converting said structure-tree representation into an abstract-circuit representation that is a network of basic components interconnected by abstract channels, each such basic component representing an elementary program execution and each abstract channel representing an associated program channel featuring in exacty two elementary programs interconnected thereby;

c. converting said abstract-circuit representation into a concrete-circuit representation as constrained by timing-organization requirements, circuitry-type requirements and technologic-realization requirements, while one-to-one translating each abstract channel into a wire set of the concrete circuit, and each basic component of the abstract circuit into an elementary electronic circuit, linked by at least one wire set to another electronic circuit;

d. converting said concrete-circuit representation into a very large-scale integrated-circuit lay-out while implementing at least one low-level task of providing an elementary circuit element not specified by said concrete-circuit representation but mandated by an electrical property of an in-layout passive part.

5,005,137

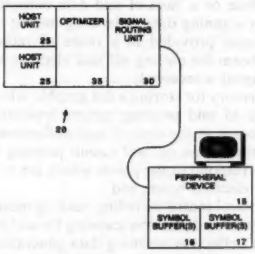
METHOD FOR OPTIMIZING DATA STREAMS CONTAINING TWO-BYTE CHARACTERS

Theodore R. Ernst, Sugar Land, Tex., assignor to BMC Software, Inc., Sugar Land, Tex.

Filed Jan. 9, 1989, Ser. No. 294,159

Int. Cl.[5] G06F *3/14, 13/00*

U.S. Cl. 364—514 **12 Claims**



5. A method of processing a data stream, containing an instruction sequence identifying a sequence of at least one character as a double byte character set (DBCS) character sequence, in a system for optimizing a formatted data stream generated at a host unit for processing at a peripheral unit to modify information contents of an addressable buffer of said peripheral unit, said method comprising the steps of:

(a) receiving the data stream from the host unit;

(b) generating an updated-state map of the peripheral unit buffer, said map reflecting the information contents of said buffer that are expected to exist after processing of the data stream at the peripheral unit;

(c) said updated-state map including at least one extension plane;

(d) setting a DBCS-character flag in a said extension plane for each character in said DBCS character sequence;

(e) altering the value of an odd-numbered flag in a said extension plane for each character in said DBCS character sequence; and

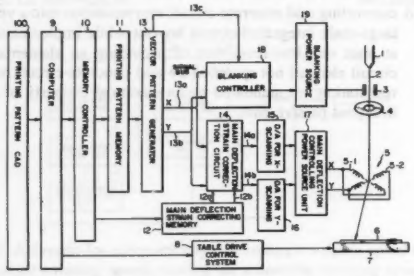
(f) performing a map comparison optimization method, utilizing the updated-state map as an operand, to generate a substitute data stream.

5,005,138

ELECTRON BEAM DIRECT PRINTING APPARATUS

Hiroaki Tobuse; Hidenobu Murakami, and Masashi Kamio, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1990, Ser. No. 511,788
Claims priority, application Japan, Apr. 20, 1989, 1-102212
Int. Cl.[5] G01N *21/00*
U.S. Cl. 364—519 14 Claims



1. An electron beam direct printing apparatus comprising:

direct printing pattern information generating means for setting an electron beam printing pattern on a circuit printing base and outputting said printing pattern as direct printing pattern information;

deflection scanning data generating means for generating data necessary for main deflection scanning by an electron beam on said circuit printing beam in a direction of the X-axis and in a direction of the Y-axis which is carried out on a basis of said printing pattern information;

electron beam deflection scanning means for executing deflection scanning by said electron beam on said circuit printing base on a basis of said data outputted from said deflection scanning data generating means;

blanking means provided in a route of radiation of said electron beam for cutting off said electron beam when a control signal is received;

a bit map memory for storing a dot graphic which represents the image of said printing pattern irradiated with said electron beam at the time of said deflection scanning by said electron beam on said circuit printing base by dots which correspond to the points which are to be irradiated with said electron beam; and

radiation control means including reading means for receiving said data for deflection scanning by said electron beam from said deflection scanning data generating means and reading the dot information at the position in the bit map memory which corresponds to the point which is to be irradiated with said electron beam in accordance with said data, writing means for judging whether or not the read information includes a dot and writing a dot at the position in said memory if there is no dot, and blanking control means for permitting radiation if there is no dot, while supplying a control signal to a blanking means so as to cut off said beam and prevent the irradiation of said base if there is a dot.

5,005,139

PIECE-WISE PRINT IMAGE ENHANCEMENT FOR DOT MATRIX PRINTERS

Charles C. Tung, Boise, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 232,814, Aug. 16, 1988, Pat. No. 4,847,641. This application Jun. 30, 1989, Ser. No. 374,494
Int. Cl.[5] G06K *15/00*
U.S. Cl. 364—519 2 Claims

1. A method for enhancing a displayed image derived from scanned input data which comprises the steps of;

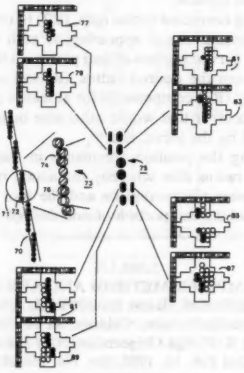
a. storing bits of digital data representative respectively of a plurality of lines having known characteristic curvatures such as smooth edge curves, sharp tips and notches;

b. reading incoming digital data which may or may not be representative of said known characteristic curvatures;

c. comparing read digital data with said stored digital data;

d. generating an error correction signal only where there is a correlation between said read data and said stored data;

e. reading an image boundary to establish an initial pattern of cells to be printed;



f. responsive to said error signal generation, converting only digital information which is representative of said known characteristic curvatures to said image boundary,

g. controlling the orientation and ink proportionality of each cell by generating subcells; and

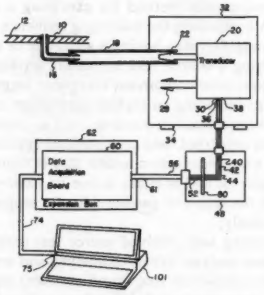
h. rearranging said subcells in a pattern to more closely follow the shape or contour of said image boundary.

5,005,140

METHOD AND APPARATUS FOR MONITORING HYDRODYNAMIC THERAPY AND EXERCISE

Rod Havriluk, Tallahassee, Fla., assignor to Swimming Technology Research, Inc., Tallahassee, Fla.

Filed Jan. 23, 1990, Ser. No. 468,618
Int. Cl.[5] A61H *1/02*; G06F *15/00*
U.S. Cl. 364—550 4 Claims



1. A system for monitoring and measuring underwater physical therapy, comprising: an aquatic exercise assembly having a first surface and a second surface; a first remote having a first surface and a second surface; a first remote pressure port defined by said first surface; a second remote pressure port defined by said second surface, said second surface being substantially opposite said first surface; a pressure/electrical signal

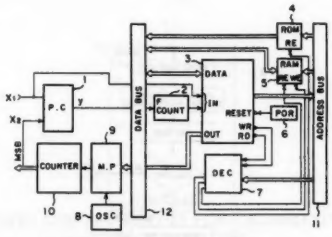
transducer; a pressure conduit connecting each of said first and second remote pressure ports to said pressure transducer, said pressure transducer for sensing the pressure at each of said first and second pressure port via a corresponding said pressure conduit and forming a differential signal representative of the difference between pressure at said first remote pressure port and said second remote pressure port; calibration means for receiving electrical signals from said transducer means and for outputting a zero pressure signal representing a background pressure level; data acquisition means for receiving said differential signal and said zero pressure signal and for outputting a digital signal representative of said differential signal, compared to said zero calibration signal thereby allowing movement of the aquatic exercise assembly to be monitored for monitoring hydrodynamic therapy and exercise.

5,005,141

PHASE-LOCKED LOOP CIRCUIT

Kazunori Sanada, and Jyoji Kawai, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1989, Ser. No. 334,471
Claims priority, application Japan, Apr. 25, 1988, 63-102012
Int. Cl.[5] G06F *15/20;* **H03K** *5/13*
U.S. Cl. 364—550 **12 Claims**



1. A phase-locked loop circuit, comprising:

phase comparator means for detecting a phase difference between an input signal and a feedback signal and for outputting the resultant phase difference data twice per each cycle of said input signal;

calculator means for executing a phase control calculation based on the output of said phase comparator means; and

a variable-frequency oscillator circuit for producing an output signal of a frequency conforming to the result of calculation of said calculator means.

5,005,142

SMART SENSOR SYSTEM FOR DIAGNOSTIC MONITORING

John B. Lipchak, Forest Hills; Tod A. Oblak, Belle Vernon; Fred H. Bednar, Millvale; William Ciaramitaro, Murrysville; Francis R. Hughes, Verona; John R. Smith, Monroeville, and Gregory A. Gisoni, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 10,504, Jan. 30, 1987, abandoned. This application Jul. 24, 1989, Ser. No. 386,008
Int. Cl.[5] G21C *17/00;* **G05B** *15/02*
U.S. Cl. 364—550 **18 Claims**

1. A smart sensor system, comprising:

one or more sensors for a monitored component;

a remote processor for processing and analyzing sensor signals from said one or more sensors;

a communication link connected to said remote processor; and

a component monitor connected to said communication link, located physically in association with the monitored component and located physically remotely with respect to said remote processor, said monitor including at least

conditioning and multiplexing means for conditioning and selecting one of the sensor signals, wherein said conditioning and multiplexing means includes at least one sensor preprocessing module, each sensor preprocessing module including at least

a channel selection latch for storing a channel selection signal;

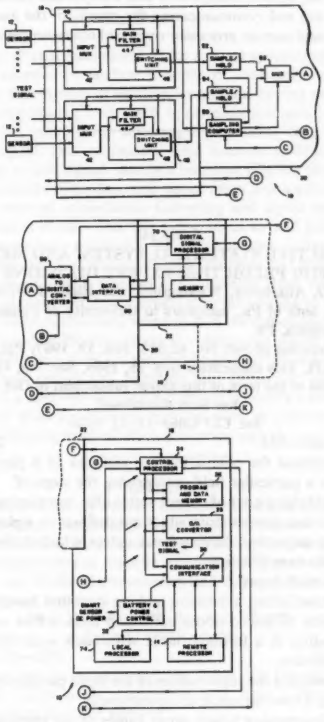
an input multiplexer, operatively connected to said channel selection latch, for receiving the sensor signals from said one or more sensors and for selecting one of the sensor signals as a selected sensor signal based on the channel selection signal;

a gain control latch for storing a gain control value;

a programmable gain control amplifier, operatively connected to said input multiplexer and said gain control latch, for amplifying the selected sensor signal based on the gain control value and for outputting an amplified signal;

a frequency selection latch for storing a frequency selection value;

a switching unit, operatively connected to said fre-



quency selection latch and said programmable gain control amplifier, for receiving the amplified signal and outputting a differential signal;

clock signal generating means for outputting a clock signal in dependence upon the frequency selection value; and

a programmable filter, operatively connected to said switching unit, for lowpass filtering the differential signal based on the clock signal and for outputting a preprocessed sensor signal;

conversion means for converting the sensor signals into digital samples;

signal analysis means for processing and analyzing the digital samples; and

control means for designating selection, conditioning and acquisition of sensor signals, designating a type of analysis performed on the digital samples, performing sensor signal analysis to determine and indicate pending sensor, component and component monitor failure and communicating the results of the analysis to said remote processor over said communications link.

5,005,143

INTERACTIVE STATISTICAL SYSTEM AND METHOD FOR PREDICTING EXPERT DECISIONS

Martin D. Altschuler, Wallingford, and Richard Whittington, Media, both of Pa., assignors to University of Pennsylvania, Philadelphia, Pa.

Continuation of Ser. No. 65,304, Jun. 19, 1987, Pat. No. 4,872,122. This application Sep. 25, 1989, Ser. No. 411,911

The portion of the term of this patent subsequent to Oct. 3, 2006, has been disclaimed.

Int. Cl.[5] G06F *15/42, 9/00*

U.S. Cl. 364—554 **2 Claims**

1. A method for comparing the analyses of a plurality of experts in a particular field, comprising the steps of:

(a) establishing a set of output actions for combinatory situations, said combinatory situations defined by a plurality of input parameters having input values which define a particular case situation;

(b) for each expert,

(1) establishing a decision making structure having a plurality of linked nodes extending from a first node and ending in a terminal node with each node defining a question;

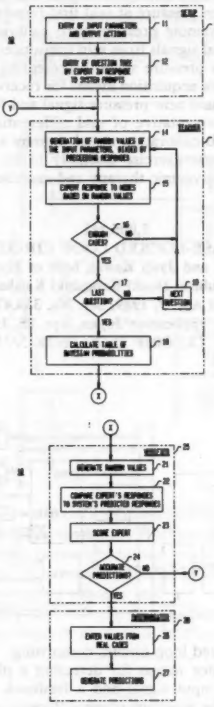
(2) entering the input values of the input parameters defining a case situation to be analyzed;

(3) determining which input values of the particular case situation are significant input values from node to node and predicting which response the expert would make for a question posed at the first node based on the significant input values and then predicting additional responses for questions posed at each subsequent node, said subsequent nodes forming a path based on the prior predicted responses through the decision making structure;

(4) repeating step (3) through the linked nodes until a predicted response is an output action at a terminal node of the decision-making structure; and

(5) determining the probability that the expert would have selected the output action predicted in step (4).

(c) comparing the determinations of which input values are significant input values from step (b) (3) and the output action arrived at in step (b) (4) of an expert's decision making structure with that of another expert's decision



making structure to determine which input values are most significant in arriving at an output action.

5,005,144

SIGNAL PROCESSING SYSTEM FOR FLOW VELOCITY IN LASER DOPPLER VELOCIMETER

Tsuyoshi Nakajima, 3-19 Mefuyamate, Takarazuka-shi, Hyogo-ken, and Yuji Ikeda, Maison de Cascade Rokko 205, 111-1 Miyasaka, Suishashindenaza, Nada-ku, Kobe-shi, Hyogo-ken, both of Japan

Filed Jul. 10, 1989, Ser. No. 378,098

Int. Cl.[5] G01P *3/36*

U.S. Cl. 364—565 **17 Claims**

1. A flow velocity measurement processor for a laser Doppler velocimeter, comprising:

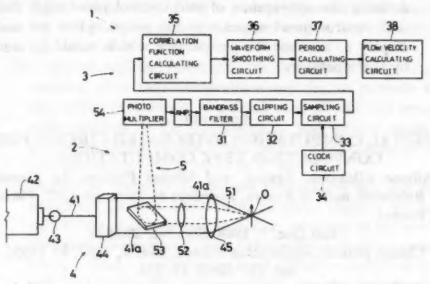
clipping means for receiving a Doppler burst signal obtained from a photomultiplier of a laser Doppler velocimeter and digitizing the Doppler burst signal by clipping it at a fixed level to output a pulse signal;

sampling means for receiving the pulse signal from the clipping means and sampling the pulse signal with a pre-set clock signal to output a digitized pulse signal;

digital correlation function calculating means for receiving the digitized pulse signal from the sampling means and calculating a correlation function of the digitized pulse signal to output a correlation signal;

period calculating means for receiving the correlation signal from the digital correlation function calculating means and detecting a crossing point at which the correlation signal crosses over a pre-set threshold level and calculat-

ing the period of the correlation signal based on the crossing point to provide a frequency of the correlation signal; and



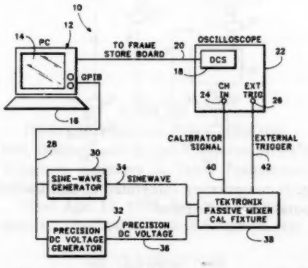
flow velocity calculating means for calculating the flow velocity of a measuring object based on the frequency from the period calculating means.

5,005,145

METHOD AND APPARATUS FOR CALIBRATING A SCAN CONVERTOR

Timothy L. Falk, and Geoffrey B. Rhoads, both of Vancouver, Wash., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 19, 1989, Ser. No. 367,997
Int. Cl.[5] G01R *35/00, 13/00*
U.S. Cl. 364—571.02 **16 Claims**



1. In a calibration system for a scan convertor having a scanning target with a horizontal axis related to time and a vertical axis related to voltage wherein a voltage map is generated for the vertical axis and a timing map is generated for the horizontal axis, an improved method of generating the timing map for the horizontal axis comprising the steps of:

scanning the target with a calibration periodic waveform having a known frequency;

estimating an ideal waveform for the calibration waveform;

calculating the phase differences between the ideal waveform and the calibration waveform; and

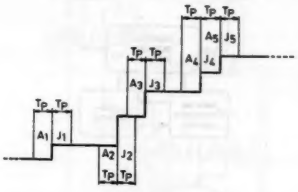
generating timing values for the timing map as a function of the calculated phase differences between the ideal waveform and the calibration waveform.

5,005,146

SIGNAL PROCESSING METHOD FOR NUCLEAR SPECTROMETERS

Tamás Lakatos; József Molnár, and Endre Madarász, all of Debrecen, Hungary, assignors to Magyar Tudományos Akadémia Atommag Kutató Intézete, Budapest, Hungary

Continuation-in-part of Ser. No. 39,250, Apr. 16, 1987, abandoned. This application Dec. 20, 1988, Ser. No. 289,398
Int. Cl.[5] G06G *7/12;* **G01J** *1/00*
U.S. Cl. 364—573 **8 Claims**



1. A signal processing method for nuclear spectrometers and the like adapted to analyze a series of randomly-occurring electrical data signals of random length and having randomly varying amplitudes, impressed upon electrical noise-bearing background, comprising: selecting a processing time interval for the signal, said processing time interval embracing the onset time of said signal; setting a base-line filtering time interval immediately preceding said signal onset and a signal filtering time interval immediately following said signal onset, the total duration of said intervals being equal to said processing time; continuously measuring the instantaneous voltage value in said base-line and signal filtering intervals and subtracting the base-line filtering interval voltage value from the corresponding signal filtering (internal) interval voltage to create a series of difference values, wherein said corresponding instantaneous base-line filtering interval voltage and signal filtering interval voltage values are symmetric in time offset from said onset of said signal; and summing said difference values according to a selected weighting function whereby a portion of said signal filtering interval may be used as portion of the base-line filtering interval for a following signal.

5,005,147

METHOD AND APPARATUS FOR SENSOR FUSION

Kumar Krishen, Seabrook, Tex.; Scott W. Shaw, Saratoga, Calif., and Rui J. P. deFigueiredo, Houston, Tex., assignors to The United States of America as represented by the Administrator, the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 30, 1988, Ser. No. 292,130
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—578 **20 Claims**

1. A method for determining the shape of a remote surface by sensor fusion using incomplete data from a plurality of sensors, comprising the steps of

(a) obtaining from a first sensor a first electronic signal representative of the surface,

(b) constructing a first electronic model of the surface using the first electronic signal,

(c) using first electronic model as a guide, constructing for a second sensor a predicted electronic signal also representative of the surface,

(d) obtaining from the second sensor an actual electronic signal representative of the surface,

(e) minimizing the difference between the predicted electronic signal and the actual electronic signal,

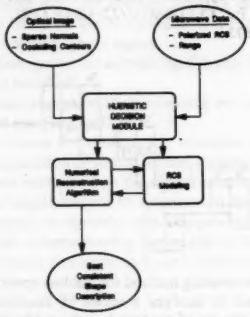
(f) constructing an additional electronic model of the surface using the result of step (e) as a guide,

(g) using the additional electronic model of the surface in constructing an additional predicted electronic signal for the second sensor,

(h) obtaining from the second sensor an additional actual electronic signal representative of the surface,

(i) minimizing the difference between the additional predicted electronic signal and the additional actual electronic signal,

(j) repeating steps (f) through (i) until the difference between



the final predicted electronic signal and the actual electronic signal is below a predetermined threshold level whereby, the shape of the remote surface, represented by the final predicted electronic signal, is determined more accurately than can be done with either the first or second sensor alone, and

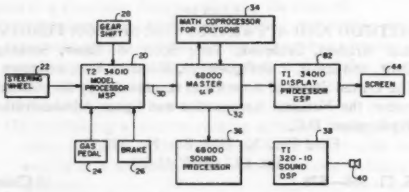
(k) displaying the shape of the remote surface.

5,005,148

DRIVING SIMULATOR WITH MOVING PAINTED DASHBOARD

Max L. Behensky, Hayward; Rick L. Moncrief, Santa Clara; Jed Margolin, San Jose, and Stephanie J. Mott, Sunnyvale, all of Calif., assignors to Atari Games Corporation, Milpitas, Calif.

Filed Jan. 12, 1989, Ser. No. 296,553
Int. Cl.[5] G09B 9/04
U.S. Cl. 364—578 **16 Claims**



13. A method of displaying a control panel of a vehicle on a video display and shifting the displayed position of said control panel to simulate perspective change to the operator of said vehicle comprising the steps of:

reading control inputs from said operator indicating desired movements of said simulated vehicle and calculating therefrom data indicating the position at which to display said control panel taking into account the forces acting on the operator's head and the compliance of the operator's body resisting movement of the operator's head; and

using said data to control the output of video data defining the appearance of said control panel such that said control panel appears in the proper place on said display to simulate the perspective which would be seen by said operator.

15. An apparatus for displaying a shifting control panel of a simulated vehicle on a video display comprising:

means for reading inputs from an operator indicating disired movements of said simulated vehicle and calculating therefrom data indicating the position at which to display said control panel taking into account the forces acting on the operator's head and the compliance of the operator's body resisting movement of the operator's head; and

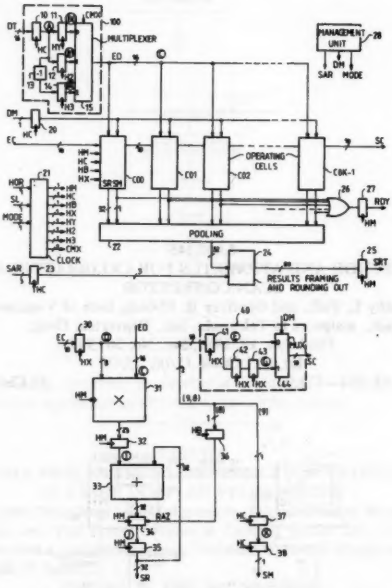
means for using said data to control the output of video data defining the appearance of said control panel such that said control panel appears in the proper place on said display to simulate the perspective which would be seen by said operator.

5,005,149

DIGITAL COMPUTATION INTEGRATED CIRCUIT FOR CONVOLUTION TYPE COMPUTATIONS

Philippe Elleaume, Antony, and Michel Prevost, Le Plessis Robinson, both of France, assignors to Thomson CSF, Paris, France

Filed Dec. 7, 1988, Ser. No. 280,882
Claims priority, application France, Dec. 8, 1987, 87 17051
Int. Cl.[5] G06F 15/336
U.S. Cl. 364—728.01 **6 Claims**



1. A digital computation integrated circuit for convolution type computations of the form

$$\sum_i C_i X_j$$

with $j=i+k$, j and k being integers and i being a natural integer, where C_i represents complex coefficients having a real and an imaginary part and X_j represents either complex or real input data, respectively corresponding to a complex data operating mode of said integrated circuit, wherein said input data have a real and an imaginary part, and to a real data operating mode of said integrated circuit, wherein said input data have only a real part, said circuit comprising:

a plurality of operating cells connected to each other in a sequence and which simultaneously receive the input data, a propagation bus for sending in succession the real and imaginary parts of each coefficient C_i to a first of said

operating cells in said sequence, each of said cells including:

(a) a multiplier having an output connected to an adder accumulator comprising an adder and an accumulator register connected to form a loop, whereby each operating cell performs computations corresponding to a different value of k,

(b) a second register, inserted in the loop of said adder accumulator, after said accumulator register, to provide for alternative processing, at a clock rate, of real and imaginary portions of the computation, said second register providing output results of said each cell for computations corresponding to said value of k, and

(c) means for transferring, on said propagation bus, real and imaginary parts of coefficients received thereon by that cell, to a next cell in said sequence; whereby in each cell, the real and imaginary parts received on said propagation bus are, firstly, applied to an input of the multiplier of that cell and, secondly, retransmitted, by the transferring means of that cell, with a suitable delay, to the next cell, said coefficients thus being propagated from one cell to the next; and

logic means for receiving clock signals and said input data and for ensuring time distribution and repetition of said real and imaginary parts of said input data on a data bus towards said operating cells whereby said each cell is enabled to successively and alternatively provide real and imaginary partial products of the computation.

5,005,150

DIGITAL SIGNAL PROCESSORS

Peter R. Dent, Bedford, and Rajpal S. Bharya, Brickhill, both of United Kingdom, assignors to Texas Instruments Incorporated, Dallas, Tex.

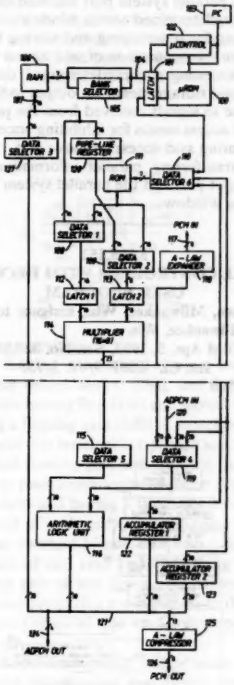
Filed Apr. 12, 1989, Ser. No. 336,956

Claims priority, application United Kingdom, Apr. 12, 1988, 8808569

Int. Cl.[5] G06F *7/38*

U.S. Cl. 364—736 **13 Claims**

1. A digital signal processor incorporated in an integrated circuit and including first and second sources of binary numbers, a parallel binary multiplier having a first input port with a first plurality of conductors for receiving in parallel a first plurality of bits defining a first number, a second input port with a second plurality of conductors for receiving in parallel a second plurality of bits defining a second number, and an output port with a third plurality of conductors for transmitting in parallel a third plurality of bits representing the product of the first and second numbers, the first plurality being substantially larger than the second plurality, a first data selector connected from the first and second sources to the first input port of the multiplier, a second data selector connected from the first and second sources to the second input port of the multiplier, and means for controlling the operation of the first



and second data selectors according to the number of bits in the binary numbers from the first and second sources.

5,005,151

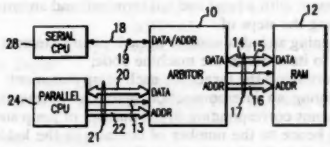
INTERLEAVED ARBITRATION SCHEME FOR INTERFACING PARALLEL AND SERIAL PORTS TO A PARALLEL SYSTEM PORT

Hal Kurkowski, Dallas, Tex., assignor to Dallas Semiconductor Corporation, Dallas, Tex.

Filed May 13, 1988, Ser. No. 194,025

Int. Cl.[5] G06F *13/00*

U.S. Cl. 364—900 **41 Claims**



1. An arbiter for selectively interfacing a serial input port and a parallel input port with a parallel system port for transfer of information therebetween, comprising:

a serial communication link connected to the serial port for transmitting and receiving serial information;

a parallel communication link connected to the parallel input port for transmitting and receiving parallel information;

converting means for receiving parallel information from the parallel system port and converting it to serial infor-

mation for transmission to the serial communication link and for receiving serial information from the serial communication link and converting it to parallel information for transmission to the parallel system port;

serial port access means for transferring parallel data between the parallel system port and said converter means during a predetermined access window;

storage means for determining and storing the duration of time before the occurrence of said access window;

means for accessing the predetermined duration of time stored in said storage means for output to the parallel port in response to signals received from the parallel port;

parallel port access means for inhibiting access by the parallel port during said access window; and

means for transferring parallel information between the parallel input port and the parallel system port outside of said access window.

5,005,152

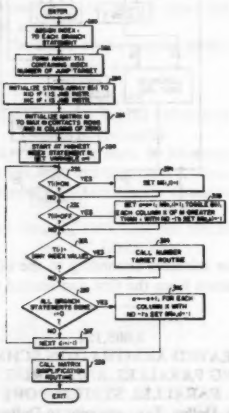
INDUSTRIAL CONTROLLER WITH DECOMPILABLE USER PROGRAM

Neil W. Knutsen, Milwaukee, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Apr. 5, 1989, Ser. No. 333,196

Int. Cl.[5] G06F *9/44, 3/153*

U.S. Cl. 364—900 **3 Claims**



1. A method of decompiling a series jump format machine code implementation of a ladder logic program comprised of a series of jump statements, each examining a contact status and jumping to a target, and including a COIL ON and a COIL OFF routine, into a ladder logic diagram comprised of interconnected numbered succeeding contacts arranged in rungs, each contact with a head and tail terminal, and an output coil, comprising the steps of:

a) assigning an index number to each jump statement according to its order in the machine code;

b) determining the target for each jump statement;

c) creating an interconnection matrix of elements having columns corresponding to the number of jump statements and hence to the number of contacts in the ladder logic diagram and rows corresponding to the number of points of interconnection between contacts;

d) placing head marker elements and tail marker elements in the matrix by analyzing each jump statement and its target so that each column will have only one head marker element and one tail marker element representing the head and tail terminal of a contact whose sequential number corresponds to the column number and so that the row of the head marker element and the row of the tail marker element define interconnections between the terminals of that contact and the terminals of contacts associated with other columns; and

e) displaying a ladder logic diagram by:

i) displaying a contact having a head and tail terminal for each column the contact having a head and tail terminal;

ii) connecting the head terminal of each contact to the head terminals of all other contacts having head marker elements in the row of the head marker element of that contact and to the tail terminals of all other contacts having a tail marker element in the row of the head marker element of that contact; and

iii) connecting the tail terminal of each contact to the head terminals of all other contacts having a head marker element in the row of the tail marker element of that contact and to the tail terminals of all other contacts having a tail marker element in the row of the tail marker element of that contact.

5,005,153

DATA PROCESSOR INTEGRATED ON A SEMICONDUCTOR SUBSTRATE

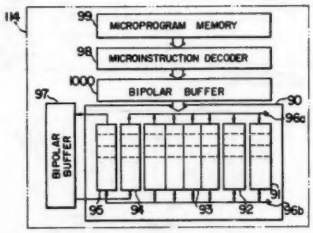
Hideo Maejima, and Ikuro Masuda, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 13,204, Feb. 6, 1987, abandoned, which is a continuation of Ser. No. 535,054, Sep. 23, 1983, abandoned. This application Feb. 12, 1988, Ser. No. 155,484

Claims priority, application Japan, Sep. 29, 1982, 57-168502; Oct. 27, 1982, 57-187569

Int. Cl.[5] G06F *13/00*

U.S. Cl. 364—900 **20 Claims**



6. A data processor integrated on a semiconductor substrate comprising:

an instruction decoder comprising a plurality of MOSFETs, for decoding instructions; and

a processing circuit being controlled by the decoded instructions, and comprising a plurality of elements including an arithmetic logic unit, a shifter, an operation register, an input register and an output register, each connected to an internal bus to provide a path for the transfer of data and each comprises of a plurality of MOSFETs,

wherein the connection of the at least one of said elements to said internal bus includes a bipolar buffer to reduce signal transmission delay along said data transfer path.

5,005,154

HIGH SPEED PROGRAMMABLE READ ON MEMORY DEVICE FORMED BY BIPOLAR TRANSISTORS

Hajime Masuda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 19, 1989, Ser. No. 381,902

Claims priority, application Japan, Jul. 19, 1988, 63-181025

Int. Cl.[5] G11C *11/34*

U.S. Cl. 365—96 **16 Claims**

1. A programmable read only memory device having a read out mode of operation and a write-in mode of operation, comprising:

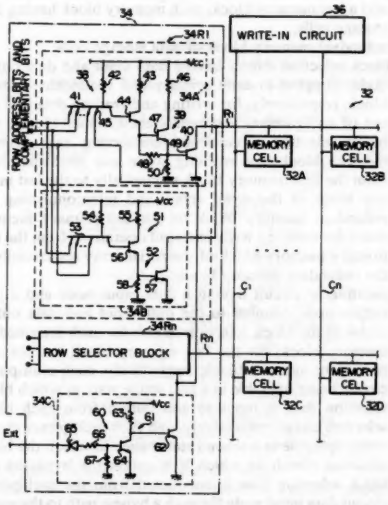
(a) a plurality of memory cells arranged in rows and columns and having respective elements each capable of being permanently changed in resistance with a large amount of a write-in current, each of said memory cells being operative to store a data bit of either logic "1" or "0" level depending upon the resistance of the element of the memory cell;

(b) a plurality of row lines respectively coupled to the rows of said memory cells;

(c) a plurality of column lines respectively coupled to the columns of said memory cells;

(d) column selector means coupled to said column lines and responsive to a column address signal for supplying one or a plurality of said column lines with said write-in current in said write-in mode of operation and with a small amount of a read out current with respect to said write-in current in said read out mode of operation;

(e) a row selector circuit having a plurality of row selector blocks respectively associated with said row lines, and responsive to a row address signal for selectively activating one of the row selector blocks, thereby providing a



current path from one of said row lines to a first constant voltage source; and

(f) an output circuit coupled to the aforesaid one or a plurality of said column lines in said read out mode of operation to change the voltage level or levels on the column line or lines for producing an output signal or signals representative of the data bit or bits stored in one or a plurality of the memory cells, in which each of said row selector blocks comprises a first discharging unit having a large current driving capability and activated in said write-in mode of operation for providing most of said current path, and a second discharging unit having a small current driving capability with respect to said first discharging unit and activated for providing the remaining part of said current path in said write-in mode of operation and for providing the current path in said read out mode of operation, and in which said programmable read only memory device further comprises a control unit responsive to an external signal and operative to establish most of said current path in said write-in mode of operation and to block most of said current path in said read out mode of operation.

5,005,155

OPTIMIZED ELECTRICALLY ERASABLE PLA CELL FOR MINIMUM READ DISTURB

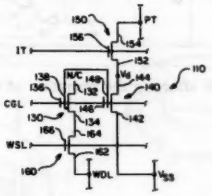
Nader A. Radjy, San Francisco, and Michael S. Briner, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 15, 1988, Ser. No. 207,323

The portion of the term of this patent subsequent to Jun. 19, 2007, has been disclaimed.

Int. Cl.[5] G11C *16/04*

U.S. Cl. 365—185 **9 Claims**



1. Apparatus comprising:

an array of floating gate tunnel devices including a first floating gate tunnel device (130), said first floating gate tunnel device having first (134) and second (136) terminals and having a floating gate (138) in tunnelling communication with said first terminal in response to a field generated between said floating gate and said first terminal;

a floating gate read transistor having first (142) and second (146) terminals and having a floating gate (148), said second terminal of said read transistor being common with said second terminal of said first tunnel device and said floating gate of said read transistor being common with said floating gate of said first tunnel device;

circuitry responsive during a sense mode to the charge level on a selected subset of said tunnel devices in said array; and

means, operative during said sense mode regardless of whether said first floating gate tunnel device is in said selected subset, for applying a first predetermined non-zero voltage to said second terminal of said read transistor relative to said first terminal of said read transistor and a second predetermined non-zero voltage to said first terminal of said tunnel device relative to said first terminal of said read transistor.

5,005,156

SEMICONDUCTOR DEVICE HAVING OUTPUT BUFFER CIRCUIT CONTROLLED BY OUTPUT CONTROL SIGNAL

Yasuhiro Takai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 27, 1989, Ser. No. 457,631

Claims priority, application Japan, Dec. 27, 1988, 63-331724

Int. Cl.[5] G11C *11/34*

U.S. Cl. 365—189.05 **11 Claims**

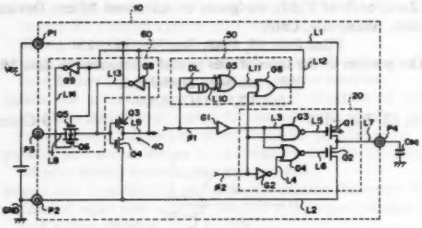
1. A semiconductor device having a data output buffer circuit controlled by an output control signal, comprising:

an output detecting circuit for detecting the level changes in the data signal inputted to said data output buffer circuit;

a signal input circuit, an output level of which is determined on the basis of the detection of the level changes in the data signal by said output detecting circuit; and

a holding circuit for holding said output level of said signal input circuit,

whereby possible output noises attendant on the data outputting operation of said data output buffer circuit are prevented from affecting the operation of said signal input circuit.

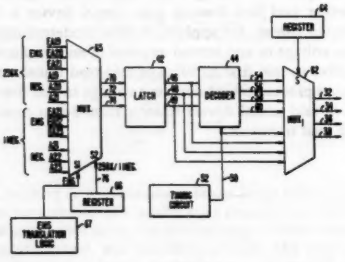


5,005,157

APPARATUS FOR SELECTIVELY PROVIDING RAS SIGNALS OR RAS TIMING AND CODED RAS ADDRESS SIGNALS

Robert W. Catlin, Santa Clara, Calif., assignor to Chips & Technologies, Inc., San Jose, Calif.

Filed Nov. 13, 1989, Ser. No. 436,143
Int. Cl.[5] G11C *7/00, 11/408*
U.S. Cl. 365—193 **7 Claims**



1. A memory control unit comprising:

N row address strobe (RAS) outputs;

means for selectively providing an address externally provided to said memory control unit or a translated expanded memory space (EMS) address, said means for selectively providing addresses including a multiplexer;

said multiplexer including two additional inputs of different address bits of said EMS address and external address for a different size of memory bank;

means for decoding said addresses to select, for predetermined addresses, one of N decode outputs;

means for providing a timing signal to control the duration of a signal on said selected decode output; and

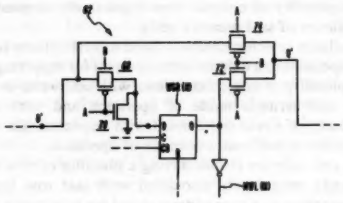
multiplexing means, coupled to said means for providing addresses, said means for decoding and said means for providing a timing signal, for selectively coupling to said RAS outputs said addresses and said timing signal or said decode outputs.

5,005,158

REDUNDANCY FOR SERIAL MEMORY

David C. McClure, and Mark A. Lysinger, both of Carrollton, Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Jan. 12, 1990, Ser. No. 464,219
Int. Cl.[5] G11C *8/04;* **G06F** *11/20*
U.S. Cl. 365—200 **10 Claims**



1. A fault tolerant serial memory comprising, in combination:

a serial array of primary memory blocks including a first memory block, one or more intermediate memory blocks and a last memory block, each memory block having data storage cells;

a redundant memory block of data storage cells;

a block selection circuit having data input and data output nodes coupled to each primary and redundant memory block, respectively, for writing and reading data into and out of said primary and redundant memory blocks, said block selection circuits interconnecting said primary memory blocks for enabling write and read operations from the first memory block sequentially to the last memory block in the serial array, and interconnecting the redundant memory block to the last primary memory block for enabling write and read operations from the first primary memory block of the serial array sequentially to the redundant memory block;

a multiplexer circuit having a data input node and a data output node coupled to the data input and data output nodes of the block selection circuit for each intermediate memory block, for the last memory block and for said redundant memory block, respectively, each multiplexer circuit being operable in a first stable state in which block selection data is input to and output from each block selection circuit respectively, and each multiplexer circuit being operable in a second stable state in which the block selection circuit to which it is coupled is bypassed and block selection data is conducted from the multiplexer circuit data input node through a bypass path to the multiplexer circuit data output node, respectively.

5,005,159

CONTINUITY LOGGING USING DIFFERENCED SIGNAL DETECTION

Christine E. Krohn, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Nov. 1, 1989, Ser. No. 430,513
Int. Cl.[5] G01V *1/40*
U.S. Cl. 367—57 **19 Claims**

13. Method of continuity logging guided waves in the lithographic region located between two boreholes, comprising

(a) first seismic sourcing at a first depth location in a first borehole,

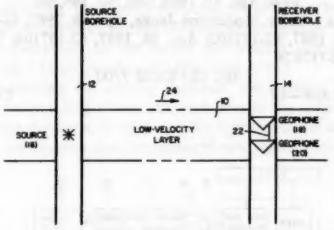
(b) first receiving the direct impulses from said first depth location in a second borehole at a seismic receiver and developing a first signal value,

(c) second seismic sourcing at said first depth location in said first borehole in substantially the same manner as said first seismic sourcing,

(d) second receiving the direct impulses from said second

sourcing at a depth location in said second borehole a predetermined short vertical distance from the location of said first receiving at said seismic receiver and developing a second signal value,

(e) developing a differenced signal by subtracting one of said first and second signals from the other, and



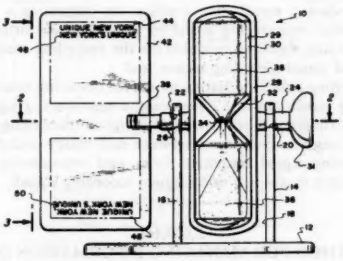
(f) at subsequent discrete depth locations in said respective first and second boreholes, repeating steps (a) through (e), wherein an appreciable differenced signal at a specific depth indicates the presence of guided waves in a continuous low-velocity lithographic layer at such specific depth.

5,005,160

GAME TIMING APPARATUS

Robert A. DeMars, 7210 Jordan Ave., Canoga Park, Calif. 91303

Filed Apr. 5, 1990, Ser. No. 505,165
Int. Cl.[5] G04F 1/04
U.S. Cl. 368—95 **6 Claims**



1. A game timing apparatus comprising:

a base, said base adapted to be placed on a planar supportive surface;

a mounting frame mounted on said base, said mounting frame including a pair of stanchions extending from said base and located in a substantially parallel spaced apart relationship defining a gap therebetween;

an hourglass mounted on said stanchions of said mounting frame, said hourglass being pivotably on said stanchions, said hourglass having a transparent bulb defining a pair of chambers separated by a necked down waist, said bulb having a longitudinal center axis, during sufficient pivotable movement of said bulb said longitudinal center axis will be perpendicular to said base, a quantity of sand located within said chamber, said sand being movable between said chambers during pivoting of said hourglass;

a support frame, said bulb being fixedly mounted on said support frame, said support frame being located within said gap, said support frame including a pair of stub shafts mounted directly adjacent said waist, said stub shafts being in axial alignment, one said stub shaft connecting with one said stanchion and the other said stub shaft connecting with the remaining said stanchion; and

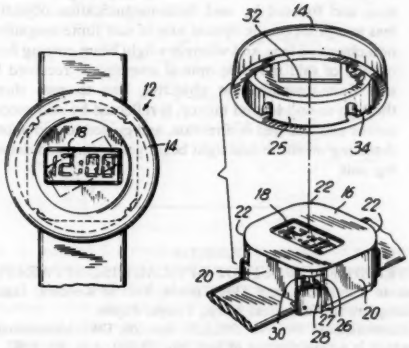
card mounting means mounted on one of said stub shafts, said card mounting means adapted to removably support a planar card upon which is located indicia, whereby as said hourglass is pivoted so is said card and said card mounting means.

5,005,161

CHANGEABLE WATCH BEZEL LOCKING MECHANISM

Irving Boilen, New York, N.Y., assignor to Trans-Action Marketing Corp., New York, N.Y.

Filed Apr. 17, 1990, Ser. No. 510,314
Int. Cl.[5] G04B 37/00
U.S. Cl. 368—295 **8 Claims**



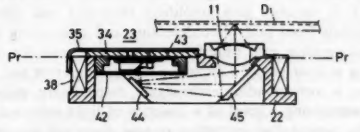
1. A watch assembly comprising in combination a wristwatch body including a time display, the cross-section of the wristwatch body being cylindrical and defining a circular cross-section with a plurality of chord sections, said wristwatch body including a first locking means, and a bezel adapted to be positioned on said wristwatch body, said bezel including a second locking means, said second locking means including at least one radially disposed projection being cooperatively associated with said first locking means on said wristwatch body so that said bezel can be releasably secured to said wristwatch body by placing said bezel over said wristwatch body and by rotating said bezel into a locked position, whereby each chord section is separated by a curved region, each said chord section providing clearance for said radially disposed projection so that said wristwatch body integrally fits into said bezel, said bezel being removable from said timepiece by rotating said bezel in the opposite direction.

5,005,162

OPTICAL HEAD DEVICES FOR USE IN DISC PLAYERS

Koji Mitsumori, and Hidehiro Kume, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 14, 1989, Ser. No. 338,184
Claims priority, application Japan, Apr. 25, 1988, 63-101964
Int. Cl.[5] G11B 7/00
U.S. Cl. 369—44.12 **13 Claims**



1. An optical head device in a disc player comprising:

a movable optical assembly which has a finite magnification objective lens, a first mirror and a second mirror, and a light beam generating and detecting unit having a semiconductor substrate including photodetecting means and

light beam generating means formed thereon, said finite-magnification objective lens, said first and second mirrors, and said light beam generating and detecting unit being supported in said movable optical assembly by a common supporting member, and

a driving mechanism for moving said movable optical assembly in both a first direction along an optical axis of said finite-magnification objective lens and a second direction substantially perpendicular to said first direction;

wherein, in said movable optical assembly, a light beam generated by said light beam generating means is reflected by said first mirror and changed in direction, reflected further by said second mirror and changed again in direction, and focused by said finite-magnification objective lens at a point on the optical axis of said finite-magnification objective lens, and wherein a light beam coming from outside of said movable optical assembly is received by said finite-magnification objective lens to pass therethrough to said second mirror, is reflected by said second mirror and changed in direction, and guided to said photodetecting means in said light beam generating and detecting unit.

5,005,163

LEVEL SHIFT CIRCUIT OF OPTICAL DISC APPARATUS

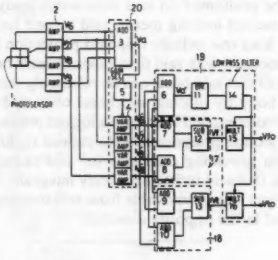
Makoto Yamamoto, and Akio Terada, both of Kodaira, Japan, assignors to Nakamichi Corp., Tokyo, Japan

Continuation of Ser. No. 302,125, Jan. 26, 1989, abandoned, which is a continuation of Ser. No. 39,260, Apr. 17, 1987, abandoned. This application May 16, 1990, Ser. No. 523,199

Claims priority, application Japan, Apr. 18, 1986, 61-57421

Int. Cl.[5] G11B *7/095*

U.S. Cl. 369—44.36 **3 Claims**



1. An optical disc apparatus, comprising:

a servo circuit including an automatic gain control device having a predetermined range of permissible input signal levels, and

a shifting circuit for shifting the level of signals inputted to said servo circuit, said shifting circuit comprising: photodetecting and converting means for detecting optical signals reflected from the optical disc and for converting the detected optical signals into electrical signals, a plurality of variable gain amplifiers receiving said electrical signals from said photodetecting and converting means aid variable gain amplifiers outputting signals for detecting at least one of a focussing or tracking error and forming a corresponding error signal, respectively, means for determining a level of a quantity of light reflected from the optical disc according to said electrical signals, and gain set means for selecting one of a plurality of gains of said variable gain amplifiers depending on the level determined so that the outputs of said variable gain amplifiers are within the predetermined range of permissible input signal levels of said automatic gain control device.

5,005,164

RECORDING AND REPRODUCING APPARATUS

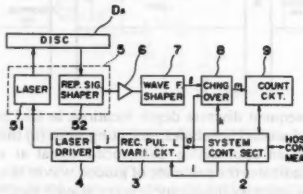
Noriaki Sakamoto, Kyoto; Shigemi Maeda, Yamatokortyama; Toshihiro Yamanaka, Ikoma; Toshihisa Deguchi, Nara; Nobuyuki Horie, Yamatokoriyama; Takeshi Yamaguchi, and Kunio Kojima, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 27, 1988, Ser. No. 186,580

Claims priority, application Japan, Apr. 28, 1987, 62-105616; Apr. 28, 1987, 62-107102; Apr. 28, 1987, 62-107104; May 13, 1987, 62-117574

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—48 **17 Claims**



1. A recording and reproducing apparatus comprising:

system control means for developing a binary-coded original recording signal;

recording condition control means for controlling recording conditions during the recording of said binary-coded original recording signal on a recording medium;

signal recording means for recording said original recording signal onto said recording medium in response to said recording conditions set by said recording condition control means;

reproducing signal output means for outputting a binary-coded reproducing signal by detecting said original recording signal as recorded on the recording medium by said signal recording means; and

recording condition setting means for obtaining said recording conditions and developing a reproducing signal approximately equal to said original recording signal through a comparison between said binary-coded reproducing signal outputted from said reproducing signal output means and said original recording signal.

5,005,165

METHOD FOR MANAGING INFORMATION ON A STORAGE MEDIA WITHOUT LOSING INFORMATION DUE TO EFFECTS

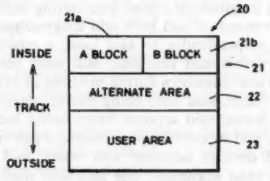
Toshihiro Yamanaka; Shigemi Maeda, and Nobuyuki Horie, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 14, 1988, Ser. No. 284,328

Claims priority, application Japan, Dec. 15, 1987, 62-316862

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—58 **7 Claims**



1. A method for managing defect information comprising the steps of:

(a) providing a first and second defect information storage area in a storage medium;

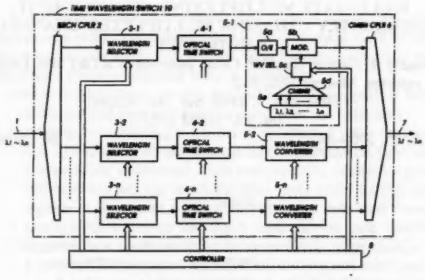
(b) determining if a defect is present in the storage medium;
(c) storing location data of the determined defect in a work area;
(d) determining which defect information storage area has a greater number of registrations stored therein, a registration representing a location data of a single defect in the storage medium;
(e) transferring, for storing purposes, registrations from the defect information storage area having the greater number of registrations to the defect information storage area having a lesser number of registrations; and
(f) transferring, for storing purposes, the location data of determined defect from the work area to the defect information storage area receiving the registrations in said step (e), the location data becoming a new registration.

5,005,166

TIME AND WAVELENGTH DIVISION SWITCHING SYSTEM

Syuji Suzuki, and Makoto Nishio, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 30, 1988, Ser. No. 251,486
Claims priority, application Japan, Sep. 30, 1987, 62-248347; Dec. 1, 1987, 62-305152; Jun. 2, 1988, 63-136955
Int. Cl.[5] H04J *14/00*
U.S. Cl. 370—1 **17 Claims**



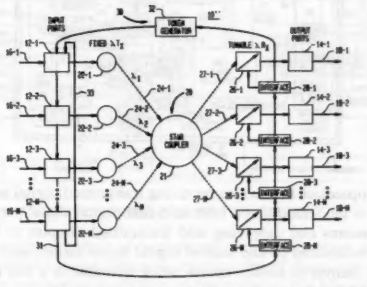
1. A time and wavelength switch comprising:
a plurality of wavelength selector means each having a signal input terminal and a signal output terminal, the input terminal of each said selector means receiving a plurality of incoming time division multiplexed (TDM) channels of different optical wavelengths, each said wavelength selector means being capable of selecting, in response to a first, wavelength switching signal applied thereto, one of said incoming TDM channels which is carried on a first wavelength and allowing said selected TDM channel to appear at the output terminal thereof; and
a plurality of time-slot switching and wavelength conversion stages associated respectively with said plural wavelength selector means, each of said stages having a single input terminal connected to the output terminal of the associated wavelength selector means and a single output terminal of said stage and being capable of deriving from a first time slot of the selected TDM channel an output signal of a second time slot carried on a second wavelength in response to a second, time-slot switching signal applied thereto and a third, wavelength switching signal applied thereto and allowing said output signal to appear at the output terminal thereof.

5,005,167

MULTICAST PACKET SWITCHING METHOD

Edward Arthurs, Summit; Matthew S. Goodman, Belle Meade; Chong K. Kim, Livingston, and Tony T. Lee, Bridgewater, all of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Division of Ser. No. 306,528, Feb. 3, 1989, Pat. No. 4,896,934. This application Oct. 11, 1989, Ser. No. 420,010
Int. Cl.[5] H04J *14/08*
U.S. Cl. 370—4 **9 Claims**



1. A method for routing packets in optical form from a plurality of input ports of a switch to a plurality of output ports of said switch, said method comprising:
during a first control phase of a packet transmission cycle, writing information into a control token at particular input ports so as to reserve particular output ports,
passing said control token among input ports to resolve contentions among said particular input ports wanting to reserve the same said particular output ports and between output ports to tune said particular output ports for receiving packets from said particular input ports,
transmitting said token from said particular input ports to said particular output ports on a distinct network independent of the optical packets being routed,
during a second control phase of a packet transmission cycle, reading said control token at said particular output ports and tuning said particular output ports in response to said token to enable them to selectively receive packets from said particular input ports, and
during a transmission phase which follows said first and said second control phases of a packet transmission cycle, optically transmitting said packets via an optical branching network from said particular input ports to all output ports including said particular output ports.

5,005,168

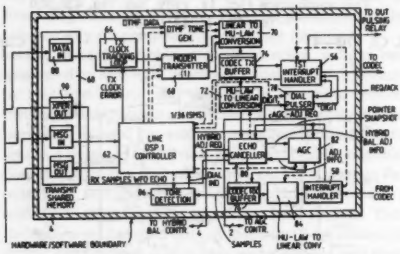
MULTIRATE WIRE LINE MODEM APPARATUS

Peter Cummiskey, Clark, N.J.; Marvin Epstein, Monsey, N.Y.; Paul A. Gilmour, Bloomfield, and Richard Kim, Nutley, both of N.J., assignors to ITT Corporation, New York, N.Y.

Filed May 2, 1988, Ser. No. 189,497
Int. Cl.[5] H04B *1/56;* **H04J** *15/00;* **H04L** *5/111*
U.S. Cl. 370—24 **40 Claims**

1. Modulator/demodulator apparatus comprising:
first digital signal processor means operable in a full duplex mode for providing digital samples to be transmitted to a coder decoder and receiving transmitted digital samples therefrom, said first digital signal processor means being responsive to received samples for initiating echo cancellation in said received samples;
second digital signal processor means operable to demodulate samples received from said first digital signal processor and outputting demodulated message information therefrom; and
input/output processor means for initiating operations of said first and second digital signal processor means, said input/output processor means receiving input information

to be transmitted and supplying said information to said first digital processor means and receiving demodulated message information from said second digital signal processor means and outputting said demodulated message information to at least one user device, said input/output



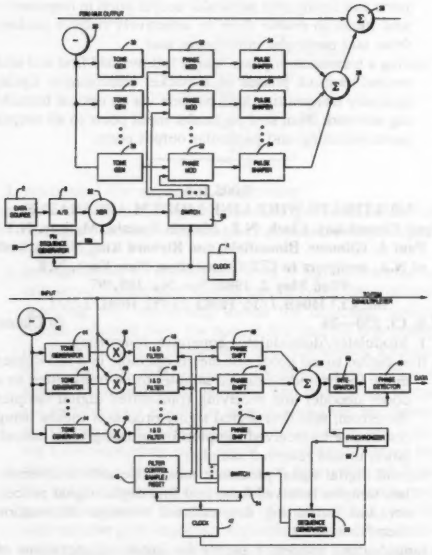
processor means also receiving transmitted digital samples to be demodulated from said first digital signal processor means and supplying said transmitted samples to be demodulated to said second digital signal means, said input-/output processor means being operable in a full duplex mode of operation.

5,005,169

FREQUENCY DIVISION MULTIPLEX GUARDBAND COMMUNICATION SYSTEM FOR SENDING INFORMATION OVER THE GUARDBANDS

Joseph B. Bronder, East Berlin, Pa., and William H. Gossard, Grasonville, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 16, 1989, Ser. No. 437,153
Int. Cl.[5] H04J *1/14, 1/20*
U.S. Cl. 370—76 **4 Claims**



1. A frequency division multiplex (FDM) guardband communication system for using guardbands for sending additional signals between the information bands of the frequency division multiplex system, comprising:

generator means for generating pn chips;

data means for providing data to the system;

converting means, operatively connected to said data means, for converting the signal to digital form, if required;

combining means, operatively connected to said converting means and said generator means, for combining a predetermined number of pn chips with a number of data bits and obtaining signal chips;

switching means, operatively connected to said combining means, for assigning the signal chips to individual guardbands;

modulation means, operatively connected to said combining means, for combining digital data to be added to the frequency division multiplex system with the pn chips;

means, operatively connected to said modulation means, for summing the pn modulated digital signals to a FDM output for transmission through a communication medium;

shifting means for translating each guardband to DC;

filter means, operatively connected to said shifting means, for isolating individual chips and outputting a signal;

sampling means, operatively connected to said filter means, for sampling and phase alignment of the output signals from said filter means;

summing means, operatively connected to said sampling means, for summing outputs from said sampling means; and

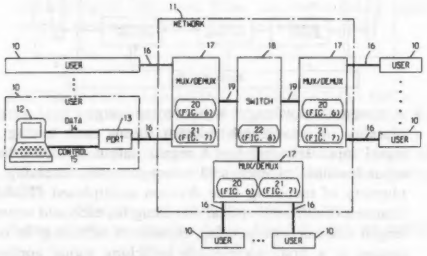
detector means, operatively connected to said summing means, for recovering the signal added to the frequency division multiplex system.

5,005,170

MULTI-RATE MULTIPLEXING ARRANGEMENT EFFICIENTLY UTILIZING MULTIPLEXED CHANNEL BANDWIDTH

Donald R. Nelson, Boulder, Colo., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 9, 1990, Ser. No. 462,361
Int. Cl.[5] H04J *3/22*
U.S. Cl. 370—84 **34 Claims**



1. A subrate multiplexer comprising:

means for receiving a plurality of first signal streams each at a subrate of a predetermined transmission rate;

means cooperative with the receiving means for subrate-multiplexing the plurality of received first signal streams into a second signal stream such that the second signal stream comprises a plurality of adjacent frames each having an identical sequence of time slots of equal duration with different ones of the time slots of a frame assigned to carry signals from different ones of the first signal streams and with sequentially identical time slots of a plurality of the adjacent frames assigned to a same one first signal stream;

means cooperative with the receiving means and the subrate-multiplexing means for assigning to at least one first signal stream a plurality of time slots in each frame, at least some of the time slots of the assigned plurality being separated

from others of the time slots of the assigned plurality by at least one time slot assigned to a different first signal stream and at least some of the time slots of the assigned plurality being non-periodically distributed with respect to others of the time slots of the assigned plurality within the sequence of the time slots of a frame; and

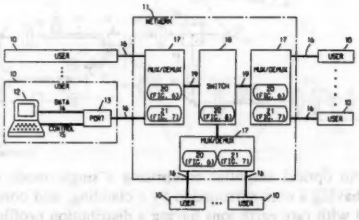
means cooperative with the subrate-multiplexing means for transmitting the second signal stream at the predetermined transmission rate.

5,005,171

TELECOMMUNICATION TRANSMISSION FORMAT SUITED FOR NETWORK-INDEPENDENT TIMING ENVIRONMENTS

David R. Modisette, Jr., Broomfield, and Donald R. Nelson, Boulder, both of Colo., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 9, 1990, Ser. No. 462,374
Int. Cl.[5] H04J 3/12
U.S. Cl. 370—110.1 **20 Claims**



1. An arrangement for transmitting control signals and data signals as a sequence of delineated units of signals, with at least the data signals having a present data transmission rate that fluctuates about a nominal rate, comprising:

means for assigning to the control and data signals a fixed transmission rate greater than the nominal rate; and

means for transmitting a stream of delineated units carrying the data signals at the present data transmission rate, and transmitting delineated units carrying the control signals interspersed among the delineated units carrying the data signals at a present control transmission rate that fluctuates and is equal to the fixed transmission rate less the present data transmission rate to maintain transmission of a continuous sequence of adjacent delineated units carrying the data and control signals at the fixed transmission rate;

whereby the present control transmission rate varies inversely with the present data transmission rate.

5,005,172

DIAGNOSTIC SYSTEM IN A DATA PROCESSING SYSTEM

Masakazu Kawamoto, Komae, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 15, 1989, Ser. No. 323,941
Claims priority, application Japan, Mar. 18, 1988, 63-064941
Int. Cl.[5] G06F 11/00
U.S. Cl. 371—18 **7 Claims**

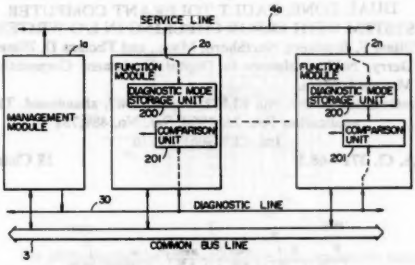
1. A diagnostic system in a data processing system constituted by a management module and a plurality of function modules, each having an address, a normal mode, and a diagnostic mode, and each being connected to said management module through a common bus line, said diagnostic system comprising:

service line means, operatively connected to the management module and said plurality of function modules, for issuing a diagnostic mode command;

diagnostic line means, operatively connected to said management module and said plurality of function modules, for providing a signal indicating a transfer of diagnostic data on the common bus line;

diagnostic mode storage means provided in each of the function modules, and operatively connected to said service line means for setting the diagnostic mode; and

comparison means, provided in each of the function modules, and operatively connected to said diagnostic mode storage means and to said diagnostic line means, for comparing a content of said diagnostic mode storage means with the signal indicating the transfer of diagnostic data, by comparing an address on the common bus line with an address of a corresponding function module, a resultant data of the comparison being used as a condition for a module selection for the diagnosis so that a transfer of diagnostic data in said diagnostic mode is separated from the transfer of the data in said normal mode.

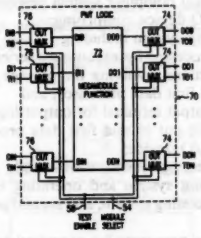


5,005,173

PARALLEL MODULE TESTING

Robert C. Martin, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 7, 1988, Ser. No. 281,308
Int. Cl.[5] G06F 11/00
U.S. Cl. 371—22.6 **29 Claims**



25. An integrated circuit, comprising:

a first module of operation circuits, said first module having a plurality of first data terminals;

a plurality of first multiplexers, each of said first multiplexers having a first external data terminal and a first test terminal, each of said first multiplexers coupling a respective one of said first data terminals to said first external data terminal during normal operation and to said first test terminal during testing of said first module to permit test patterns of a testing program corresponding to said first module to be input into said first module;

a second module of operation circuits, said second module having a plurality of second data terminals;

a plurality of second multiplexers, each of said second multiplexers having a second external data terminal and a second test terminal, each of said second multiplexers coupling a respective one of said second data terminals to said second external data terminal during normal operation and to said second test terminal during testing of said

second module to permit test patterns of a testing program corresponding to said second module to be input into said second module; and

a bus for coupling to a source of test patterns, said bus having a plurality of conductors, each of said first test terminals and said second test terminals coupled to one of said plurality of conductors.

5,005,174

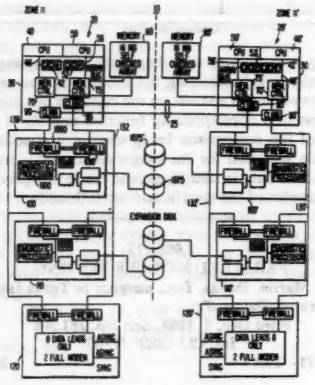
DUAL ZONE, FAULT TOLERANT COMPUTER SYSTEM WITH ERROR CHECKING IN I/O WRITES

William F. Bruckert, Northboro, Mass., and Thomas D. Bissett, Derry, N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 93,572, Sep. 4, 1987, abandoned. This application Feb. 26, 1990, Ser. No. 489,751

Int. Cl.[5] G06F *11/16*

U.S. Cl. 371—68.3 **18 Claims**



1. A fault tolerant computer system designed to be coupled to at least one I/O device comprising:

a first processing system including

a first data processor for executing a series of data processing instructions involving the passage of data into and out of said first data processor, and

a first data output terminal for outputting a portion of the data passing out of said first data processor to said at least one I/O device;

a second processing system, substantially identical to said first processing system and operating independently of said first processing system, said second processing system including

a second data processor for executing said series of data processing instructions in the same sequence as said first data processor, said second data processor's execution of said instructions involving the passage of data into and out of said second data processor, and

a second data output terminal for outputting a portion of the data passing out of said second data processor to said at least one I/O device;

synchronizing means, coupled to said first and second data processors, for maintaining the execution of said series of data processing instructions by said first and second processing systems in synchronism; and

fault detection means, coupled to said first and second processing systems at said first and second output terminals, respectively, for receiving from said first and second processing systems only the portion of the data output from said first data output terminal of said first processing system to said at least one I/O device and the portion of the data output from said second data output terminal of said second processing system to said at least one I/O device, said fault detection means including means for identifying the presence of an error in said fault tolerant computer system when the portion of said data output from said first processing system at said first output terminal is different from the portion of the data output from said second processing system at said second output terminal.

5,005,175

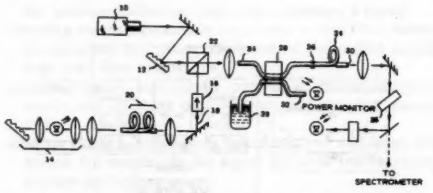
ERBIUM-DOPED FIBER AMPLIFIER

Emmanuel Desurvire; Clinton R. Giles, both of Middletown; Jay R. Simpson, Fanwood, and John L. Zyskind, Shrewsbury, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 27, 1989, Ser. No. 441,495

Int. Cl.[5] G02B *6/00*; H01S *3/00*

U.S. Cl. 372—6 **15 Claims**



1. An optical amplifier comprising a single mode optical fiber having a core surrounded by a cladding, said core being doped with rare earth ions having a distribution profile, and

means for generating a pump signal at a pump wavelength, said pump wavelength capable of coupling the ground state of the rare earth ions to an excited state which is an upper pump level of a three level lasing system having the ground state as the lower level of the lasing transition, said generating means being optically coupled to said optical fiber, the transmission mode of the optical fiber at the pump wavelength having a radius which is greater than the radius of the distribution profile of the rare earth ions in the core.

5,005,176

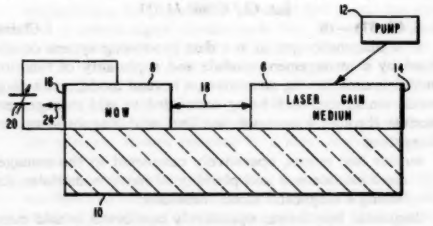
METHOD AND APPARATUS FOR Q-SWITCHING A LASER

Juan F. Lam, and Thomas C. Hasenberg, both of Agoura Hills, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 4, 1990, Ser. No. 504,758

Int. Cl.[5] H01S *3/11*

U.S. Cl. 372—10 **17 Claims**



1. An optical amplification method, comprising:

storing photon energy in a Type II staggered alignment multiple quantum well (MQW) structure by optically exciting the MQW structure with electromagnetic radiation,

applying an electric field across the MQW structure of sufficient magnitude to induce a release of optical energy from the structure, and

applying electromagnetic radiation at a wavelength substantially matched with that of the MQW energy release as an input to the MQW structure during at least a portion of said energy release, such that said energy release is amplified with respect to said input.

5,005,177

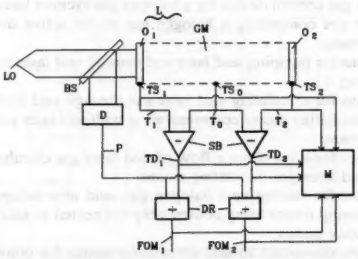
LASER OPTICS QUALITY MONITORING

Paul H. Beckwith, Ottawa, Canada, assignor to Lumonics Inc., Kanata, Canada

Filed Sep. 27, 1989, Ser. No. 413,096

Int. Cl.[5] H01S *3/04*

U.S. Cl. 372—34 **12 Claims**



1. A method of monitoring optical quality of optical means of a gas laser having a pair of optical means, the method comprising:

measuring a temperature of at least one of a pair of optical means of a gas laser;

measuring a surrounding temperature of an enclosure for the laser; and

subtracting said surrounding temperature from the measured temperature of said optical means to obtain a corresponding temperature differential thereby enabling monitoring of said optical means.

5,005,178

LASER DIODE MODULE

Johannes T. M. Kluitmans, and Hindrik Tjassens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 425,375, Oct. 17, 1989, abandoned, which is a continuation of Ser. No. 297,796, Jan. 17, 1989, abandoned. This application May 11, 1990, Ser. No. 523,308

Claims priority, application Netherlands, Jan. 22, 1988, 8800140

Int. Cl.[5] H01S *3/045*

U.S. Cl. 372—36 **19 Claims**

1. A laser diode module comprising:

a rectangular box-like metal casing with a bottom, two long and two short sidewalls, a tubular passage for a glass fibre being provided in one of the short sidewalls, and no less than eight guide pins being passed through the bottom in a standardized DIL order, no less than one of the guide pins being inserted in the bottom by means of electrically conducting material and the remaining guide pins being inserted in the bottom by means of feedthrough insulators;

a thermoelectric cooler having two thermal contact pads, one contact pad being thermoconductively coupled to the bottom of the metal casing;

a plate-formed metal base carrier which is thermoconductively connected to the other thermal contact pad of the thermoelectric cooler, this base carrier accommodating:

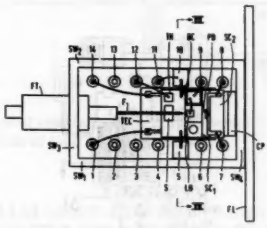
a first sub-carrier with a laser diode attached,

a second sub-carrier with a photodiode attached,

a support for arranging the glass fibre such that its end is facing the front facet of the laser diode, and

a thermistor thermally coupled with the base carrier; and

connecting lines for electrically connecting the laser diode,



the photodiode, the thermistor, the thermoelectric cooler and the metal base carrier to the respective guide pins;

wherein no less than one of the guide pins, electroconductively connected to the bottom, has a portion located inside the casing which portion has the form of a rod which over its entire length is electroconductively connected to the associated long sidewall of the casing, an electroconductive coupling being provided between the head face of the rod and the base carrier.

5,005,179

SEMICONDUCTOR DEVICE

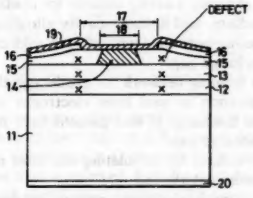
Toru Fukushima; Tsunehisa Takabayashi, and Mikio Ogai, all of Yokohama, Japan, assignors to The Furukawa Electric Company, Ltd., Tokyo, Japan

Filed Jun. 8, 1989, Ser. No. 364,366

Claims priority, application Japan, Jun. 8, 1988, 63-140832; Feb. 15, 1989, 1-35784

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—46 **13 Claims**



1. A semiconductor device comprising:

an active layer formed on a semiconductor substrate;

an electrode;

a first semiconductor layer in contact with the electrode;

a first current blocking layer formed on the first semiconductor layer and having a current confinement window;

wherein the contact resistance between the current blocking layer and the electrode is higher than the contact resistance between the electrode and the first semiconductor layer; and

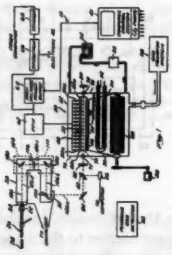
a second current blocking layer formed on said first blocking layer and provided with a dielectric insulation material having a window portion with an area larger than that of the current confinement window.

5,005,180

LASER CATHETER SYSTEM

William Edelman, Seal Beach; Dennis Constantinou, Corona Del Mar; Miles Stefanovski, Santa Ana; Yuh L. Jan, El Toro; Theodore S. Fahlen, San Jose; Ronald L. Hansen, San Jose, and Kenneth J. Kramasz, San Jose, all of Calif., assignors to Schneider (USA) Inc., Minneapolis, Minn.

Filed Sep. 1, 1989, Ser. No. 402,135
Int. Cl.[5] H01S 3/22
U.S. Cl. 372—57 15 Claims



1. An apparatus for producing and transmitting energetic optical signals, comprising:

an excimer laser for producing ultraviolet light, said laser comprising:

(a) a first elongated laser electrode having a plurality of segments, there being associated with each of said segments an individual inductive element through which each said segment is connected to a common bus;

(b) a second elongated laser electrode spaced apart from said first laser electrode, said second electrode positioned substantially parallel to said first laser electrode and substantially coextensive therewith, the space between said first and second laser electrodes forming a laser discharge gap;

(c) a preionizer positioned adjacent to one of said first and second laser electrodes throughout the effective length of said one laser electrode, said preionizer comprising a conductive element within ar insulting tube, said insulating tube proximate said one laser electrode and said conductor element in electrical connection with the other of said laser electrodes;

(d) a housing for said first and second laser electrodes, said housing defining a cavity suitable for confining a gaseous laser medium, said housing cavity allowing exchange of said gaseous laser medium between said cavity and said laser discharge gap;

(e) a pulse forming network for producing electrical pulses for application to said laser electrodes to generate an electrical discharge in said gaseous laser medium in said laser discharge gap;

(f) a gas circulator for circulating said laser medium within said housing cavity; and

(g) a trap through which said gaseous laser medium may be passed, said trap removing impurities from said gaseous medium; an optical fiber having an input end and an output end, said input end receiving optical signals from said laser and guiding them through said fiber to said output end, said fiber further comprising a substantially rod shaped core material surrounded by a substantially tube shaped cladding material, said cladding material having an optical index of refraction which is less than or equal to the index of refraction of said core material at an interface between the core and the cladding, the index of refraction of the cladding material decreasing as the radial distance from said interface increases; and

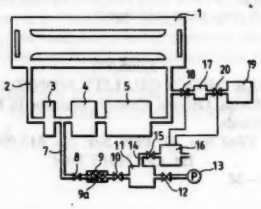
a control system for monitoring and controlling the operation of said laser.

5,005,181

METHOD FOR CONTROLLING GAS IN HALOGEN GAS LASER AND DEVICE THEREFOR

Takeo Yoshioka, and Tadao Minagawa, both of Hyogo, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Sep. 20, 1989, Ser. No. 409,916
Claims priority, application Japan, Oct. 20, 1988, 265470
Int. Cl.[5] H01S 3/22
U.S. Cl. 372—59 22 Claims



1. A gas control device for a halogen gas excimer laser using a laser gas comprising a halogen gas as the active medium, comprising:

means for pumping said laser and causing said laser to oscillate;

means for circulating said laser gas through said laser, said circulating means communicating with said laser pumping means;

means for controlling a flow of said laser gas circulating in said laser gas circulating means;

means for storing new halogen gas, said new halogen gas storing means being controllably connected to said circulating means;

means connected to said circulating means for converting said halogen gas into a low-boiling-point gas; and

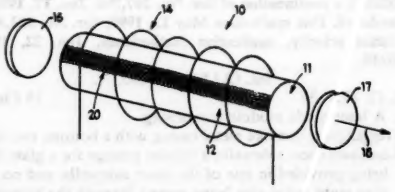
means for detecting a density of said low-boiling-point gas, said detecting means being connected to said converting means, aid density detecting means outputting a control signal to said new halogen gas storing means when said density is lower than a predetermined value for controllably supplying the new halogen gas to said circulating means whereby the level of halogen gas in said laser device is maintained above a predetermined level.

5,005,182

LASER PUMPING APPARATUS

Myron C. Muckerheide, Port Washington, Wis., assignor to Seton Health Care Foundation, Milwaukee, Wis.

Filed Oct. 11, 1989, Ser. No. 419,757
Int. Cl.[5] H01S 3/093
U.S. Cl. 372—72 9 Claims



1. An improved laser pumping apparatus comprising:

laser element having an active outer surface;

pumping energy source; and

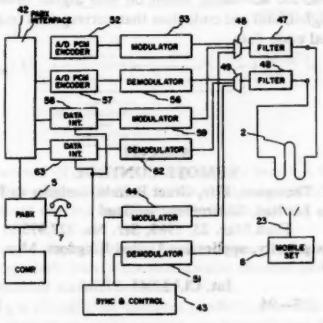
a plurality of generally spherical beads disposed in juxtaposition with at least part of said active outer surface and between said pumping energy source and said active outer surface whereby said plurality of generally spherical beads serve to increase the overall energy absorbing sur-

face area of the active outer surface, refocus the energy from the pumping source in a random fashion adjacent the active outer surface, and lengthen the dwell time to increase the pumping efficiency of the apparatus.

5,005,183
WIRELESS TELEPHONE SYSTEM

Michael J. Carey, Woolaston, England, and Adrian J. Anderson, Newport, United Kingdom, assignors to Mitel Telecom Limited, Gloucestershire, England

Continuation of Ser. No. 819,044, Jan. 15, 1986, Pat. No. 4,866,732. This application Sep. 7, 1989, Ser. No. 404,010
Claims priority, application United Kingdom, Feb. 4, 1985, 8502735
Int. Cl.[5] H04L 9/00
U.S. Cl. 375—1 **20 Claims**



1. A wireless system for telephone communication within a building, comprising:

(a) means at a central location for receiving a plurality of signals for communication with selected wireless communication terminals,

(b) means at said central location for converting said signals to spread spectrum radio frequency signals using correlation codes corresponding to particular idle channels,

(c) a leaky transmission line located in a communication region within the building,

(d) means for applying the spread spectrum radio frequency signals to said transmission line for electromagnetic radiation within said region,

(e) at least one mobile wireless communication terminal adapted to receive a predetermined one of the spread spectrum radio frequency signals within the building and for demodulating it onto an intelligible signal.

5,005,184
METHOD AND APPARATUS FOR WAVEFORM EQUALIZATION

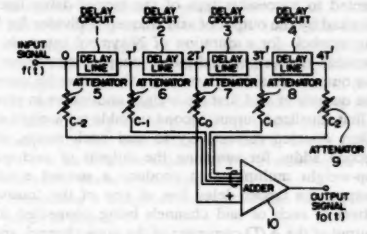
Tetsuya Amano, Hachioji; Seiichi Mita, Kanagawa; Morishi Izumita, Inagi; Nobukazu Doi, Hachioji; Mamoru Kaneko, Hokkaido; Hiroto Yamauchi, Katsuta, and Susumu Kasai, Sagamihara, all of Japan, assignors to Hitachi, Ltd.; Hitachi Denshi Kabushiki Kaisha, both of Tokyo and Hitachi Video Engineering, Inc., Kanagawa, all of, Japan

Filed Sep. 6, 1988, Ser. No. 240,196
Claims priority, application Japan, Sep. 8, 1987, 62-223026
Int. Cl.[5] H03H 7/30, 7/40
U.S. Cl. 375—14 **4 Claims**

1. A waveform equalization method for a digital modulated signal having an inverted polarity within a bit period lasting a time width of T or an inverted polarity on a boundary between bit periods, comprising the steps of:

inputting an isolated impulse response waveform of a digital modulated signal; and

compensating said isolated impulse response waveform by permitting intersymbol interference at ±T/2 with respect to the center axis of time of the waveform and eliminating

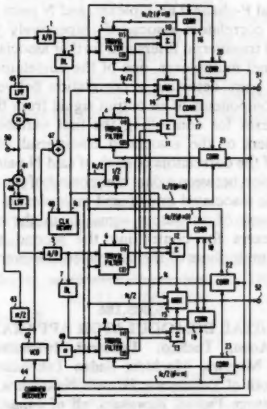


intersymbol interference at ±nT/2 which respect to the center axis of time of the waveform.

5,005,185
PARALLEL MODE ADAPTIVE TRANSVERSAL EQUALIZER FOR HIGH-SPEED DIGITAL COMMUNICATIONS SYSTEM

Shoichi Mizoguchi, and Hideki Matsuura, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jan. 19, 1990, Ser. No. 467,580
Claims priority, application Japan, Jan. 19, 1989, 1-10270
Int. Cl.[5] H04L 27/01
U.S. Cl. 375—15 **3 Claims**



1. An adaptive transversal equalizer for a demodulator, wherein the demodulator derives a P-channel (in-phase channel) baseband signal and a Q-channel (quadrature-channel) baseband signal from a received digitally modulated signal and recovers a clock signal synchronized with symbols contained in the baseband signals, and includes P-channel and Q-channel analog-to-digital (A/D) converters for converting said P-channel and Q-channel baseband signals, respectively, into P-channel and Q-channel digital data streams, comprising:

a frequency divider for dividing the frequency of said clock signal by N to produce a sequence of lower-frequency clock pulses, where N is an integer equal to or greater than two;

(N−1) P-channel delay means for delaying said P-channel digital data stream by one symbol interval to produce (N−1) successively delayed P-channel data streams, and

(N−1) Q-channel delay means for delaying said Q-channel digital data stream by one symbol interval to produce (N−1) successively delayed Q-channel data streams;

N P-channel transversal filters and N Q-channel transversal filters, each of said transversal filters comprising a tapped-delay line, latch means having inputs respectively connected to successive taps of the tapped-delay line and clocked by the output of said frequency divider for holding symbols for a duration of N-symbol intervals, first variable tap-weight multipliers coupled respectively to the outputs of said latch means, a first adder for summing the outputs of said first tap-weight multipliers to produce a first equalized output, second variable tap-weight multipliers coupled respectively to said latch means, and a second adder for summing the outputs of said second tap-weight multipliers to produce a second equalized output, the tapped-delay line of one of the transversal filters of each of said channels being connected to the output of the A/D converter of the same channel, and the tapped-delay lines of the other transversal filters of each of said channels being connected respectively to the output of said delay means of the same channel;

N P-channel adders associated respectively with the N transversal filters of each of said channels, and N Q-channel adders associated respectively with the N transversal filters of each of said channels, each of said adders summing the first equalized output of the associated transversal filter of one of said channels with the second equalized output of the associated transversal filter of the other channel;

a P-channel multiplexer for multiplexing the outputs of said P-channel adders, and a Q-channel multiplexer for multiplexing the output of said Q-channel adders; and

N pairs of P-channel correlators associated respectively with said P-channel transversal filters and further associated with said P-channel multiplexer, and N pairs of Q-channel second correlators associated respectively with said Q-channel transversal filters and further associated with said Q-channel multiplexer, one of the correlators of each of said N pairs detecting a correlation between data and error components of an output signal from the associated multiplexer for controlling the first variable tap-weight multipliers of the associated transversal filter, and the other of the correlators of each of said N pairs detecting a correlation between a data component of the output signal from the associated one of said multiplexers and an error component of an output signal from the other of said multiplexers for controlling the second variable tap-weight multipliers of the associated transversal filter.

5,005,186

DIGITAL DEMODULATOR APPARATUS

Yoshihito Aono, Tochigi; Takanori Iwamatsu, Otawara; Morihiko Minowa, Machida; Sadao Takenaka; Yoshimasa Daidoh, both of Yokohama; Hiroshi Nakamura, Sagamihara, and Nobutsugu Fujino, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP88/00280, § 371 Date Oct. 13, 1988, § 102(e) Date Oct. 13, 1988, PCT Pub. No. WO88/07302, PCT Pub. Date Sep. 22, 1988

PCT Filed Mar. 17, 1988, Ser. No. 265,459

Claims priority, application Japan, Mar. 20, 1987, 62-064145; Mar. 20, 1987, 62-064147; Jun. 17, 1987, 62-149267; Jul. 11, 1987, 62-172111

Int. Cl.[5] H04L *27/06, 5/12*

U.S. Cl. 375—82 **18 Claims**

1. A digital demodulation apparatus comprising:

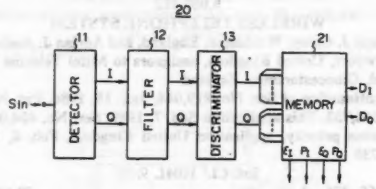
detector means for receiving and demodulating multivalue quadrature amplitude modulated signals, modulated in accordance with a honeycomb structure signal point arrangement and for providing a demodulation signal responsive to said demodulating;

filter means for wave reshaping and demodulation signal;

discriminator means for generating a digital demodulation signal; and

code decision means for successively receiving said digital demodulation signal and for reproducing an original code data, said code decision means comprises

memory means for storing code data in accordance with said honeycomb structure signal point arrangement, for



storing polarity bits P and error bits ϵ of said code data, and for accessing, based on said digital demodulation signal, said out code data that corresponds to said original code data.

5,005,187

REMOTE CONTROL

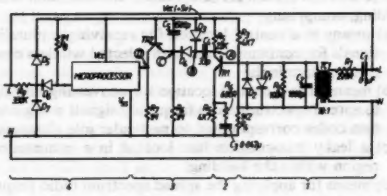
David R. Thompson, Fife, Great Britain, assignor to Pico Electronics Limited, Glenrothes, Scotland

Filed Mar. 23, 1989, Ser. No. 327,975

Claims priority, application United Kingdom, Mar. 25, 1988, 8807193

Int. Cl.[5] H04L *27/06*

U.S. Cl. 375—94 **11 Claims**



1. A slave receiver for detecting commands in the form of digital signals modulated on a cyclic carrier, the receiver comprising:

(a) an input for said carrier;

(b) capacitive means;

(c) first charging means coupling the input to said capacitive means for causing cycles of the carrier to charge the capacitive means beyond a predetermined level of charge when the carrier cycles exist above a given frequency and for at least a first given time;

(d) second charging means for applying charge to the capacitive means in the opposite direction so that, when the predetermined level of charge has been exceeded and there is a subsequent gap in the carrier cycles of a second given time, the charge falls below said predetermined level, and when carrier cycles are subsequently restored said predetermined level of charge is reached after a time directly related to the length of such gap;

(e) switching means coupled to the capacitive means to produce a binary signal corresponding to the existence of said predetermined level of charge;

(f) means for defining time windows; and

(g) means coupled to the switching means for processing said binary signal within said time windows to determine therefrom digital values dependent upon states of the binary signal within said windows.

5,005,188
CHANNEL ESTIMATION AND DETECTION FOR DIGITAL COMMUNICATION SYSTEMS

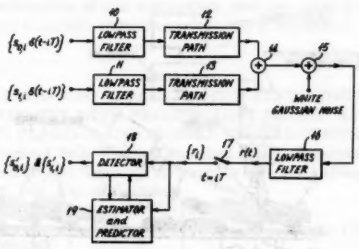
Adrian P. Clark, Loughborough, England, assignor to National Research Development Corporation, London, England

Division of Ser. No. 38,351, Apr. 14, 1987, Pat. No. 4,862,483. This application Jun. 29, 1989, Ser. No. 373,211

Claims priority, application United Kingdom, Apr. 21, 1986, 8609711

Int. Cl.[5] H04L 27/00

U.S. Cl. 375—94 **1 Claim**



1. A method of detection of signals at a receiver following transmission of symbols from at least one transmitter comprising the steps carried out for each of a succession of sample instants, of:

receiving a digital sample representative of at least one of said symbols from a communication channel between the transmitter and the receiver,

forming a plurality of different predictions of the effect of the channel on said symbols, each prediction being derived from the digital sample at that instant, and

using the predictions to carry out near-maximum likelihood detection of said digital sample received in one of said sample instants.

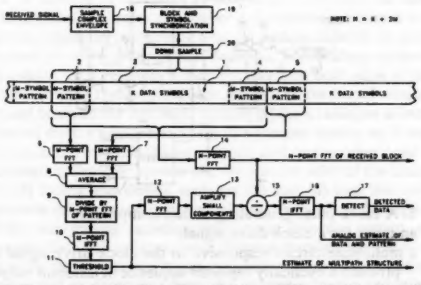
5,005,189
DETECTION OF DIGITAL SIGNALS RECEIVED FROM MULTIPATH CHANNELS

Charles M. Hackett, Jr., 38 Farragut, Irvine, Calif. 92720

Filed Jan. 23, 1989, Ser. No. 300,785

Int. Cl.[5] H04L 1/00

U.S. Cl. 375—101 **9 Claims**



1. For any positive integers N, M, and K with N=K+2M, a method for detection or demodulation of a phase-and-amplitude-shift-keyed signal having a block format wherein each block has N symbols and is comprised of a known fixed pattern of M symbols preceding and following K symbols of data, where said signal is transmitted through a channel that may have multiple propagation paths and may add interfering noise, said method comprising the steps of:

a. obtaining from a received waveform complex samples of its complex-envelope at a rate which is an integer multiple of its symbol rate;

b. establishing block synchronization and symbol synchronization for said complex samples;

c. down-sampling to the symbol rate, and buffer-storing the N complex samples of the block to be detected and the first M complex samples of the next subsequent block;

d. computing the M-point fast Fourier transform (FFT) of the first M complex samples of said block to be detected, and computing the M-point FFT of the first M complex samples of said next subsequent block, where an M-point FFT is an efficient algorithm for evaluating an M-point discrete Fourier transform;

e. computing a weighted average of the two FFT's computed in step d;

f. computing the quotient of said average formed in step e divided component-by-component by the precomputed M-point FFT of said known fixed pattern;

g. obtaining a complex vector that is an estimate of the multipath-structure of the channel by computing the M-point inverse fast Fourier transform (IFFT) of said quotient formed in step f, and subjecting the components of said IFFT to a threshold;

h. computing the N-point FFT of said estimate of the multipath-structure of the channel obtained in step g padded with K+M zeros;

i. scaling up the small components of said N-point FFT computed in step h and replacing any zero by a non-zero number;

j. computing the N-point FFT of said block to be detected;

k. dividing component-by-component said N-point FFT formed in step j by the result of step i;

l. forming analog estimates of said data symbols and pattern symbols by computing the IFFT of the result of step k;

m. detection of said analog estimates of said data symbols formed in step l by an operation appropriate for detection of a signal of the same modulation transmitted over a noisy channel having but a single propagation path.

5,005,190
WINDOW SYSTEM SYNCHRONIZING PROTECTIVE CIRCUIT

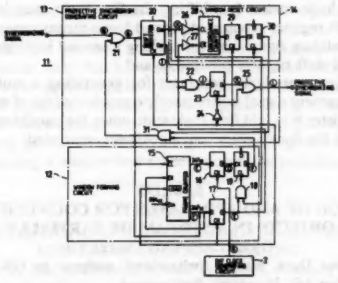
Satoshi Itoi, Osaka, Japan, assignor to NEC Home Electronics Ltd., Osaka, Japan

Filed Nov. 30, 1988, Ser. No. 278,029

Claims priority, application Japan, Nov. 30, 1987, 62-302843

Int. Cl.[5] H04L 7/08

U.S. Cl. 375—108 **17 Claims**



1. A window system synchronizing protective circuit comprising:

a bit clock for producing bit clock pulses;

window dorming circuit means for forming a variable-duration window having a predetermined position and a maximum duration corresponding to a predetermined number of said bit clock pulses, said window forming circuit

means generating a window signal representing said window;

protective synchronizing circuit means for detecting a synchronizing signal within said window and generating a protective synchronizing signal in accordance with said window signal, said duration of said window being terminated upon the detection of the synchronizing signal; and

window reset circuit means, responsive to said window forming circuit means and said protective synchronizing circuit means, for changing the position of said window when the synchronizing signal has not been detected in said window over a predetermined period.

5,005,191

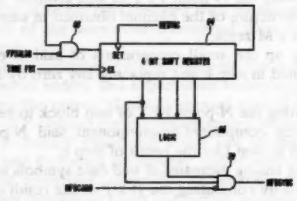
SYSTEM FOR SYNCHRONIZING DATA FRAME GROUPS IN A SERIAL BIT STREAM

James T. O'Connor, Dallas, and David A. Courtright, Carrollton, both of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Jun. 30, 1989, Ser. No. 374,278

Int. Cl.[5] H04J 3/06

U.S. Cl. 375—116 **8 Claims**



1. A system for determining multiframe alignment in a serial bit stream by a receiver, each multiframe having a plurality of frames, each frame having a plurality of bits including a frame bit, comprising:

first logic means for identifying frame alignment, wherein a frame alignment signal is generated when frame bits for a plurality of consecutive frames are available at known positions;

second logic means for generating a candidate signal when the available frame bits match a valid alignment pattern, wherein a candidate signal can be generated only simultaneously with the frame alignment signal;

a shift register having bits initially set to a first logic state, wherein said shift register is clocked by the frame alignment signal;

third logic means for shifting the first logic state into said shift register when said second logic means generate the candidate signal, and for shifting a second logic state into said shift register otherwise; and

an alignment signal generator for generating a multiframe alignment signal when exactly one selected bit of said shift register is in said first logic state when the candidate signal and the frame alignment signals are generated.

5,005,192

METHOD OF AND APPARATUS FOR COUNTING FLAT OBJECTS IN A STREAM OF PARTIALLY OVERLAPPING OBJECTS

Hanspeter Duss, Baden, Switzerland, assignor to GRAPHA-Holding AG, Hergiswil, Switzerland

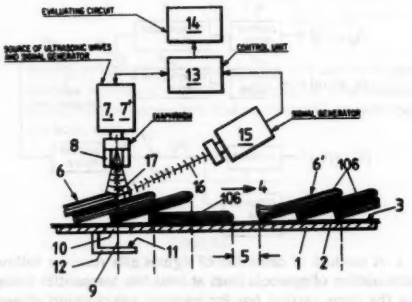
Filed Sep. 14, 1989, Ser. No. 407,058

Claims priority, application Switzerland, Sep. 30, 1988, 3654/88

Int. Cl.[5] G06M 7/10

U.S. Cl. 377—8 **16 Claims**

1. A method of monitoring flat objects of a stream of successive partially overlapping objects, particularly printed sheets, brochures, signatures, newspapers and sections of newspapers, comprising the steps of conveying the stream along a predetermined path; generating a series of ultrasonic waves; directing the ultrasonic waves of said series against successive objects of said stream in a predetermined portion of said path to thus produce ultrasonic echoes having characteristics indicative of the respective objects, including transmitting ultrasonic waves



from a first location at a first distance from said portion of said path; detecting said echoes at a second location at a second distance from said portion of said path; ascertaining the length of intervals of transmission of waves at said first location to arrival of the respective echoes at said second location; comparing the intervals for each of said waves; and utilizing the results of said comparing step to count the number of those objects which are conveyed along said portion of said path.

5,005,193

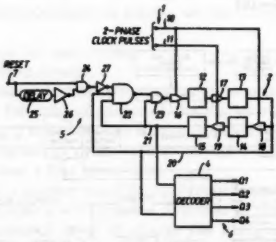
CLOCK PULSE GENERATING CIRCUITS

Richard D. Simpson, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 29, 1989, Ser. No. 374,194

Int. Cl.[5] H03K 5/19, 21/12

U.S. Cl. 377—33 **12 Claims**



1. A clock pulse generating circuit comprising:

an input for a clock drive signal;

a multi-state circuit responsive to the clock drive signal to produce a cyclically repeated sequence of different output combinations of bits, each combination including a plurality of bits;

decoding means responsive to the output combinations of the multi-state circuit to produce a plurality of clock pulse outputs corresponding respectively to the different output combinations of the multi-state circuit;

reset control circuit means interconnected between said multi-state circuit and said decoding means and responsive to a reset signal and to a particular state of the multi-state

circuit corresponding to a predetermined output combination of bits from said multi-state circuit to provide a control signal to said multi-state circuit blocking the response of the multi-state circuit to the clock drive signal for a period of time; and

the multi-state circuit continuing to follow the cyclically repeated sequence of different output combinations of bits until the predetermined output combination of bits corresponding to the particular state of the multi-state circuit is reached, the multi-state circuit in response to the control signal from said reset control circuit means being held in the particular state to which the predetermined output combination of bits corresponds until the control signal from said reset control circuit means is terminated.

5,005,194

METHOD AND APPARATUS FOR DETECTING IN CONFORMITY WITH PROCESS TIME MIXING RATIOS IN PLASTICS AND RUBBER COMPOUNDING

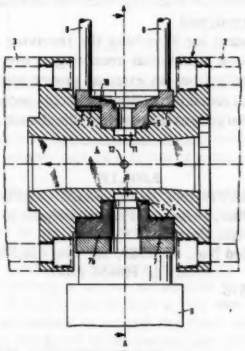
Hans-Gerhard Fritz, Uhingen, and Rudi Löffel, Karlsruhe, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 27, 1990, Ser. No. 485,430

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1989, 3906203

Int. Cl.[5] **G01N** *23/06*

U.S. Cl. 378—53 **2 Claims**



1. A method of detecting in conformity with process time mixing ratios in plastics and rubber compounding, wherein one uses an apparatus comprising a barrel section (1) with an axial channel (4) of rectangular cross section, with sliding surfaces (5) and (6) for a carriage, which can move on both sides of the barrel section (1) transversely to the axis of the barrel section (1) and bears on the one hand holders (8) for a radiation source selected from a group consisting of a gamma source, an X-ray source, and a bremsstrahlungs source, and on the other hand a scintillation detector system (9), the narrow sides of the channel (4) facing the sliding surfaces (5) and (6) and the wall thickness of the barrel section (1) being reduced in the region of the axis joining radiation source and detector system, to transirradiate the polymer melt flowing through the channel (4) with the measuring beam emanating from the radiation source and to determine from the reduction in the radiation intensity the proportion by volume k_F in accordance with the formula

$$k_F = \frac{1}{[\rho_F \cdot \mu_F - \rho_P \cdot \mu_P]} \cdot \left[\frac{1}{L} \cdot \ln\left(\frac{I_M}{I_{S_i,G}}\right) - \rho_P \cdot \mu_P\right]$$

in which

k_F=percentage proportion by volume of the filler, reinforcing material, pigment or blend component,

I_{S_i}=measured radiation intensity on the empty channel (4),

$I_{S_i,G}$=measured radiation intensity on the channel (4) filled with melt,

μ_P=mass attenuation coefficient of the polymer,

μ_F=mass attenuation coefficient of the filler, reinforcing material, pigment or blend component

L=transirradiated material length,

ρ_F=density of the filler, reinforcing material, pigment or blend component and

ρ_P=density of the polymer at the melt temperature T and the pressure p and to calculate from this the percentage proportion by weight of b of the filler, reinforcing material, pigment or blend component in accordance with the equations

$$k_P = 1 - k_F, \; a = \frac{k_P \cdot P}{[k_P(\rho_F - \rho_P) - \rho_F]} \text{ and } b = 1 - a,$$

wherein k_P stands for the percentage proportion by volume of the polymer and a stands for the percentage proportion by weight of the polymer.

5,005,195

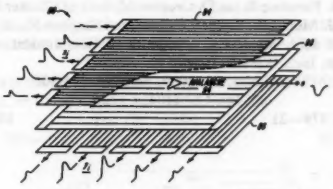
DIGITAL READOUT SYSTEM FOR RADIOGRAPHIC IMAGING

Richard C. Lanza, Brookline, and Joseph R. Votano, Tewksbury, both of Mass., assignors to Expert Image Systems, Inc., Somerville, Mass.

Filed Mar. 10, 1989, Ser. No. 321,766

Int. Cl.[5] **G01N** *23/04;* **G01T** *1/185*

U.S. Cl. 378—62 **16 Claims**



1. A readout system for transferring data from a radiation detector, the readout system comprising:

a plurality of event gating means each electrically connected to one of a plurality of detector lines for receiving signals simultaneously generated on said detector lines at a plurality of locations within a radiation detector in response to a radiation event, said event gating means operating to process the signals from a plurality of detector lines in parallel to produce a set of signals representative of the detector lines that have sensed said radiation event; and

means for estimating the locus of the radiation event from said signals by delineating said signals along at least one axis, determining the highest and lowest detector lines along said axis on which a signal has been generated, and selecting a median line as the locus of the radiation event.

5,005,196

LIMB POSITIONING AND CALIBRATION APPARATUS FOR RADIOGRAPHIC IMAGING

Richard C. Lanza, Brookline, and Joseph R. Votano, Tewksbury, both of Mass., assignors to Expert Image Systems, Inc., Somerville, Mass.

Filed Mar. 10, 1989, Ser. No. 321,990

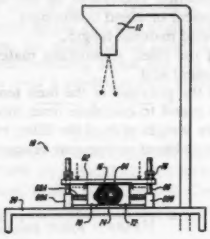
Int. Cl.[5] **G01D** *18/00*

U.S. Cl. 378—207 **10 Claims**

4. A method of calibrating a radiographic imaging system, the method comprising:

disposing at least two side blocks of materials having differ-

ent radiation absorption characteristics in stationary positions adjacent to a limb and between a photon radiation source and a detector of a radiographic imaging system said side blocks permitting concurrent measurement of differences in the intensity of photon radiation transmitted



through the two materials without affecting the acquisition of an image by the detector; and

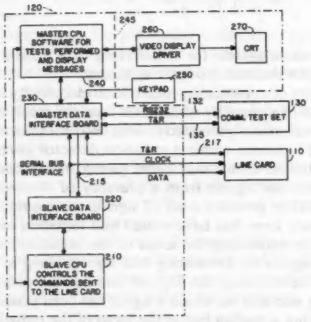
comparing the intensity of photon radiation transmitted through said blocks to establish a comparative measurement value for said imaging system.

5,005,197

METHOD AND APPARATUS AS FOR TESTING A TELEPHONE LINE INTERFACE CARD

Gerald J. Parsons; Brian D. Greenwald, both of Chester Springs; John J. McGrath, Kennett Square, and Stephen W. Andrasko, Drexel Hill, all of Pa., assignors to Communications Test Design, Inc., West Chester, Pa.

Filed Nov. 30, 1989, Ser. No. 444,106
Int. Cl.[5] H04M *3/26*
U.S. Cl. 379—21 **14 Claims**



1. Apparatus suitable for testing a line interface card (LIC) for communication system applications, said LIC including a single data terminal for alternately transmitting data from said LIC and receiving data at said LIC, said apparatus comprising:

a bidirectional data bus including a single conductor for coupling to the single data terminal of said LIC;

first processing means, coupled to the single conductor of said bidirectional data bus, for receiving and analyzing data which is produced by the LIC; and

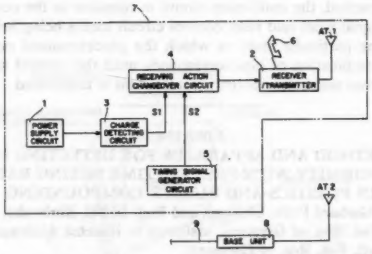
second processing means, physically distinct from said first processing means and coupled to the single conductor of said bidirectional data bus, for transmitting data to the LIC.

5,005,198

CORDLESS TELEPHONE APPARATUS

Manabu Toda, Hiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 11, 1989, Ser. No. 377,960
Claims priority, application Japan, Jul. 11, 1988, 63-173360
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—58 **11 Claims**



1. A cordless telephone apparatus including a base unit and a portable unit for transferring information between the base and portable unit by radio communications, the portable unit being powered by a rechargeable secondary battery and further including an internal receiver operating in an intermittent receiving action, the portable unit comprising:

detecting means for detecting when the secondary battery is being charged; and

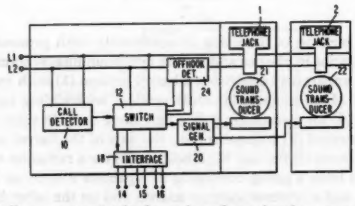
switching means for switching the receiving action of the receiver to a continuous receiving action of continual power supply from an external power source, from the intermittent receiving action, when the secondary battery is being charged, as detected by the detecting means.

5,005,199

TELEPHONE INTERFACE CIRCUIT

Christian Dupillier, Brignoud, France, assignor to Dolphin Integration, Meylan, France

Filed Nov. 15, 1989, Ser. No. 436,588
Int. Cl.[5] H04M *1/00*
U.S. Cl. 379—375 **18 Claims**



1. A line powered telephone interface circuit, comprising:

input means for receiving an input from a telephone line (L1, L2) and providing an output to at least one telephone plug (1, 2) connectable with a telephone set jack, said interface circuit connected to various terminals;

ring detector means (10) for detecting a ring signal on said telephone line;

answering means (32) for establishing an off-hook connection on said telephone line in response to a ring signal being detected for a determined time duration by said ring detector means; and

control means including timing, selecting and steering means for selectively connecting said telephone line to a selected terminal in response to a command signal received on said telephone line (12) wherein each plug includes

connection means for directly connecting to the telephone line,

inhibiting means for inhibiting the ringing of the corresponding telephone set, and

connection means for connecting a sound transducer (21, 22) with said third means, said sound transducer operable by a low voltage signal.

5,005,200

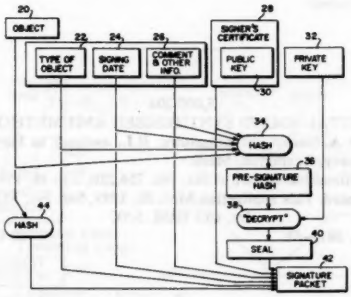
PUBLIC KEY/SIGNATURE CRYPTOSYSTEM WITH ENHANCED DIGITAL SIGNATURE CERTIFICATION

Addison M. Fischer, 60 14th Ave. S., Naples, Fla. 33942

Continuation-in-part of Ser. No. 155,467, Feb. 12, 1988, Pat. No. 4,868,877. This application Mar. 7, 1989, Ser. No. 319,780

Int. Cl.[5] H04K *1/00*

U.S. Cl. 380—30 **58 Claims**



1. In a communication system having a plurality of terminal devices coupled to a channel over which users may exchange messages, at least some of said user's having a public key and an associated private key, a method for controlling authority in a hierarchical manner among a group of users, comprising the steps of:

specifying at least first and second digital authority defining data structures, said data structures having digital values which can be associated with at least one user's private key,

said step of specifying including the step of

digitally specifying a set of authorities from a sufficient plurality of authorities so that a first user may digitally delegate authorities to second and third users so that the authorities delegated to the second user are different than those delegated to the third user, providing that the first user's digital authority defining data structure allows for such delegation; and

digitally signing by the first user the second digital data structure so that signatures performed by the second user's private key associated with the second data structure will be recognized upon an electronic analysis of the digital signature as having been granted said authority by the first user in accordance with the first user's authority-defining data structure.

5,005,201

APPARATUS AND METHOD THEREOF FOR IMPROVEMENT OF STEREOPHONIC SOUND

Mark F. Rumreich, and Robert P. Parker, both of Indianapolis, Ind., assignors to RCA Licensing Corporation, Princeton, N.J.

Filed Feb. 14, 1989, Ser. No. 310,102

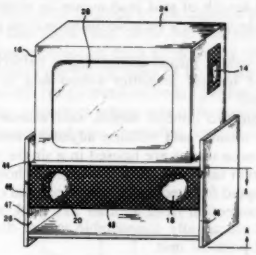
Int. Cl.[5] H04R *5/02*

U.S. Cl. 381—24 **4 Claims**

1. Apparatus for improving stereophonic sound from a source comprising:

a source of stereophonic sound having a cabinet and two internal loudspeakers disposed in a first spaced apart relationship within the cabinet and driven by stereophonic signal channels internal of the cabinet, said internal loudspeakers providing stereophonic sound external of the cabinet,

means for coupling the stereophonic signals to at least two other loudspeakers disposed eternal of the source, and



means for coupling a mixture of the stereophonic channels to said two internal loudspeakers at reduced power with respect to the external loudspeakers, said mixture of stereophonic channels comprising difference signals of said stereophonic channels.

5,005,202

HIGH FIDELITY STEREOPHONIC REPRODUCTION SYSTEM

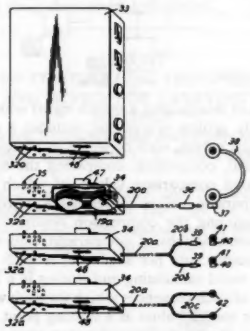
Andreas Pavel, 20, Via Gustavo Modena, Milan, Italy

Continuation of Ser. No. 105,168, Oct. 7, 1987, abandoned, which is a continuation-in-part of Ser. No. 539,232, Oct. 5, 1983, which is a division of Ser. No. 265,124, May 19, 1981, Pat. No. 4,412,106, which is a continuation of Ser. No. 47,967, Jun. 12, 1979, abandoned, which is a continuation-in-part of Ser. No. 889,664, Mar. 24, 1978, abandoned. This application Jul. 19, 1989, Ser. No. 382,048

Claims priority, application Italy, Mar. 24, 1977, 21625 A/77; Fed. Rep. of Germany, Jul. 22, 1987, 3724208

Int. Cl.[5] H04R *5/02*

U.S. Cl. 381—25 **23 Claims**



1. A personal stereo sound system device, to be carried and used on the person of at least one individual listener, comprising the combination of:

(i) a program source playback device, including control means for program selection, arranged to produce simultaneous mutually different stereo program output signals,

(ii) stereo signal amplifier means, including output volume adjusting means, impedance match to and arranged to receive said stereo output signals from said source device,

(iii) light weight paired stereo headphone or earphone means, which is the only sound reproduction means, phys-

ically remote from said source device, impedance and sensitivity matched to and arranged to receive separately, one for each phone, the output signals of said amplifier means,

(iv) multi-conductor lead means for electrically connecting said amplifiers means to said phone means,

(v) lead-reeling means capable of receiving and of dispensing a desired length of said lead means to permit the phone means to be used at a variable distance from said amplifier means,

(vi) power source means comprising a battery electrically connected to said amplifier means and to said source device, and

(vii) wherein said control means, said source device, said amplifier means, said volume adjusting means and said power source means are housed in a single portable unit, and wherein said lead reeling means are housed in a reel pack, adapted for mechanical and electrical connection to and disconnection from another like pack and mechanically and electrically connectable to and disconnectable from said portable unit.

5,005,203

METHOD OF RECOGNIZING CONTINUOUSLY SPOKEN WORDS

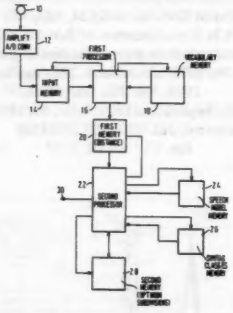
Hermann Ney, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 30, 1988, Ser. No. 175,085

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1987, 3711348

Int. Cl.[5] G10L 5/00

U.S. Cl. 381—43 **4 Claims**



1. A method of recognizing a speech signal which is derived from coherently spoken words and includes a temporal sequence of speech values, each of which indicates a section of the speech signal, comprising: comparing the speech values with given stored comparison values, of which each time a group of comparison values represents a word of a given vocabulary; summing the comparison results over different sequences of combinations of comparison values and speech values to a distance sum per sequence, at each new speech value for each word calculating and storing in a first memory a distance sum of such sequences which for each word begin at different earlier speech values as a starting point, traverse the whole word as far as the instantaneous speech value and, related to the respective starting point, produce a minimum distance sum; then, for each of these starting points, according to an assignment contained in a first stored list of the words of the vocabulary to per word at least one syntactical class, for each class storing the smallest distance sum of all words assigned to this class together with an indication about the assignment of the word yielding this smallest distance sum in a second memory; subsequently, according to a second stored list, checking whether and into which two further syntactical classes each class can be subdivided and each time that a subdivisibility is ascertained again for each starting point as far as the earliest speech signal, adding each distance sum stored for the one of the two further classes for the respective starting point and a number of intermediate points lying successively at points adjacent to each other between the starting point and the instantaneous speech value, and each distance sum stored for the other of the two further classes for each intermediate point and the instantaneous speech value, and comparing each sum with the distance sum of the subdivided class and, in case it is larger than the smallest of the added distance sums, storing said sum instead thereof together with an indication about the subdivision at the particular intermediate point which has yielded the smallest sum; and after processing the last speech value from the class indicating a whole sentence through the subdivision into further classes indicated therein at the storage site for the first speech value as starting point and through the subdivision indicated at the respective further classes, determining a sequence of words and supplying same as recognized spoken words.

5,005,204

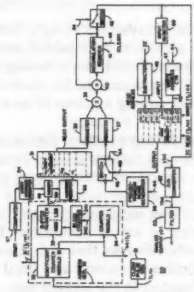
DIGITAL SOUND SYNTHESIZER AND METHOD

Michael A. Deaett, N. Kingstown, R.I., assignor to Raytheon Company, Lexington, Mass.

Continuation-in-part of Ser. No. 756,220, Jul. 18, 1985, abandoned. This application Mar. 30, 1989, Ser. No. 332,414

Int. Cl.[5] G10L 5/00

U.S. Cl. 381—51 **10 Claims**



1. A method for providing a synthesized transient signal which is a replica of an original mechanically produced transient signal comprising the steps of:

sampling said original signal to provide sampled signals at a sample rate;

grouping consecutive sampled signals into blocks;

determining the autocorrelation coefficients for the sampled signals in each block;

determining the covariance matrix coefficients of each successive block of said sampled signal from the autocorrelation coefficients of each corresponding block;

applying a pseudo-random digital noise signal which changes at the sample rate to the input of a recursive filter;

applying the coefficients derived from the covariance matrix as multiplying factors to the respective multipliers of said recursive filter for a time equal to that of a block of said sampled signal;

changing the covariance matrix derived coefficients successively applied to said recursive filter to the values corresponding to the time of each said successive block of sampled signal; and

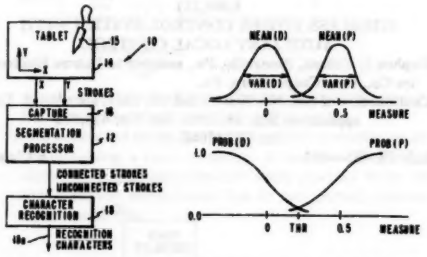
obtaining the output of said recursive filter to provide a synthesized transient signal which reproduces the sound of said original transient signal.

5,005,205

HANDWRITING RECOGNITION EMPLOYING PAIRWISE DISCRIMINANT MEASURES

Hamed A. Ellozy, Bedford Hills; Henry H. Jeanty, Patterson, and Charles C. Tappert, Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 12, 1990, Ser. No. 463,770
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—3 18 Claims



1. In a handwriting recognition system, a method for discriminating a first handwritten character from a second handwritten character, comprising the steps of:

selecting one or more discriminants that satisfy a predetermined threshold relating to a number of occurrences (N) of original characters in a training set and to a predetermined threshold relating to a percent accuracy (P) in correctly differentiating between training characters;

assigning a weight to each selected discriminant, the weight being equal to a product (P*G) of a goodness value (G) associated with the discriminant and (P); and

summing the weights to discriminate between the first and the second characters.

5,005,206

METHOD OF AND ARRANGEMENT FOR IMAGE DATA COMPRESSION BY MEANS OF A NEURAL NETWORK

Martine Naillon, Sceaux, and Jean-Bernard Theeten, Ozoir, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 20, 1989, Ser. No. 439,725
Claims priority, application France, Nov. 25, 1988, 88 15427
Int. Cl.[5] G06K 9/46
U.S. Cl. 382—56 10 Claims

1. A method used in an arrangement for image data compression by vector quantization in accordance with a precoding in blocks constituted by a plurality of picture elements, thereafter comparing by means of a neural network precoded blocks with reference words stored in the form of a code book in the neural network so as to transmit to a receiver selected indices corresponding to the index of the reference words nearest to the precoded blocks, characterized in that it includes a stage of generating an adaptive code book by means of the neural network, the stage comprising the following steps:

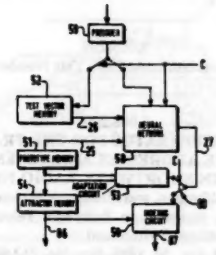
A—feeding the neural network with prototypes which prescribe the states of stable neurons in the neural network which determines its synaptic coefficients associated with each prototype during the learning phases,

B—resolving by means of the neural network with the aid of test vectors supplied by the pictures by effecting in accordance with consecutive dynamic relaxation phases performed by feeding back the input to the output of the neural network, after which the states of the neurons are stabilized in configuration denoted attractors around which the test vectors are grouped in clouds,

C—comparing each test vector with its corresponding attractor, with determination of the distance by which they are separated from each other and determination of the rate of frequentation of each attractor by the test vector,

D—determining the rough mean of all the distances:

and when this rough mean exceeds a predetermined value, selecting attractors whose rate of frequentation exceeds a predetermined rate, thereafter determining the centre



of gravity of the total cloud existing around each selected attractor to generate an optimum attractor when this attractor is the better and preserve the old attractor in the opposite case so as to form a group of new attractors which are then used again as new prototypes to restart the method of step A,

and when this rough mean is less than the predetermined value, to utilize all the final attractors, to form the reference words of the adaptive code book which are stored in a synaptic coefficients store of the neural network, said reference words being transmitted to the receiver to update its local code book,

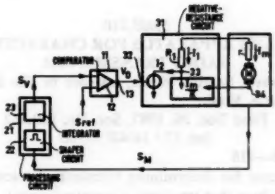
the method also including a coding stage utilizing the said reference words to encode the rough image and thereafter to select the indices to be transmitted.

5,005,207

METHOD OF CONTROLLING THE SPEED OF A D.C. MOTOR AND DEVICE FOR CARRYING OUT THE METHOD

Georges A. Grave, Maintenon, and Jean-Pierre Gaslonde, Caen, both of France, assignors to U. S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 392,047, Jun. 25, 1982, abandoned.
This application Dec. 14, 1987, Ser. No. 132,679
Claims priority, application France, Jul. 9, 1981, 81 13545
Int. Cl.[5] H02P 5/165
U.S. Cl. 388—816 16 Claims



1. A device for controlling the speed of a d.c. motor comprising: means for deriving a low frequency periodic signal

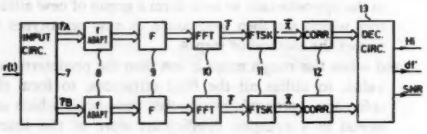
(S_M) induced by rotation of the motor, a circuit for processing said periodic signal, said processing circuit including a shaping circuit connected in cascade with an integrator circuit which supplies a motor-speed signal (S_V) comprising a direct voltage proportional to the motor-speed, a comparator circuit which compares said direct voltage (S_V) with a reference voltage (S_{ref}), said comparator circuit having an output terminal at which a control voltage (V_c) is produced, and a "negative-resistance" circuit coupled to the output terminal of the comparator circuit and to the motor such that the negative-resistance circuit at least partly compensates for the internal resistance of the motor, said control voltage being applied to an input terminal of said negative-resistance circuit so as to control the motor supply voltage to a value which is a substantially linear combination of the motor current and the control voltage.

5,005,208
Patent Not Issued For This Number

5,005,209
PROCESS AND APPARATUS FOR THE TRANSMISSION OF SELECTIVE ADDRESSES AND/OR EMERGENCY MESSAGES IN SHORTWAVE RADIO NETWORKS

Roland Kung, Wolfhausen, and Hanspeter Widmer, Zurich, both of Switzerland, assignors to Zellweger Telecommunications AG, Hombrechtikon, Switzerland

Filed Jun. 30, 1988, Ser. No. 213,601
Int. Cl.[5] H04Q *7/00*
U.S. Cl. 455—32 **23 Claims**



1. Method for the transmission of selective addresses and/or emergency messages in short-wave radio networks having several stations which each include a transmitter and/or a receiver, comprising the steps of:

operating the stations in a channel-in-band scanning mode;

transmitting a calling signal consisting of a synchronization signal and an address signal, using as the address signal a modified FSK signal which forms a diversity pair by subdivision into two identical m-ary frequency-time-shift-keying (FTSK) signals; and,

numerically processing a received signal in a frequency-time plane by carrying out a frequency adaption and a transformation of each received FTSK pulse and FTSK slot in a frequency space by a fast Fourier transformation (FFT).

5,005,210
METHOD AND APPARATUS FOR CHARACTERIZING A RADIO TRANSMITTER

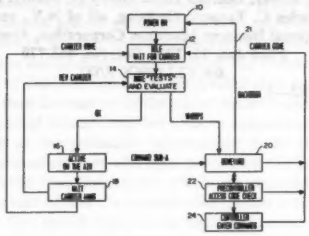
Philip J. Ferrell, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 30, 1987, Ser. No. 139,862
Int. Cl.[5] H04B *17/00*
U.S. Cl. 455—115 **20 Claims**

1. Apparatus for determining transient characteristics of a radio transmitter that transmits a transient signal, comprising:

means for receiving the transient signal transmitted by the transmitter;

means for measuring the signal phase of the transient signal with respect to a predetermined frequency; and

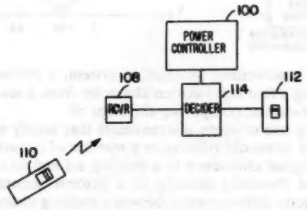


means for analyzing the signal phase of the transient signal to determine transient characteristics of the radio transmitter.

5,005,211
WIRELESS POWER CONTROL SYSTEM WITH AUXILIARY LOCAL CONTROL

Stephen J. Yuhasz, Zionsville, Pa., assignor to Lutron Electronics Co., Inc., Coopersburg, Pa.

Continuation of Ser. No. 79,845, Jul. 30, 1987, abandoned. This application Sep. 25, 1989, Ser. No. 412,572
Int. Cl.[5] H04B *10/10*
U.S. Cl. 455—603 **6 Claims**



1. A wireless power control system with auxiliary local control comprising, in combination,

(a) transmitter means to transmit a radiant first control signal,

(b) receiver means to receive and store said first control signal,

(c) auxiliary local control means to provide a second control signal,

(d) decider means to select one of said first or second control signals and to provide said selected signal to power control means to control the power supplied from a source to a load over a substantially continuous range of values, wherein said transmitter means has actuator means manually movable through a continuous range of positions to produce said first control signal.

5,005,212
INTERFERENCE SUPPRESSION IN OPTICAL COMMUNICATION SYSTEMS

Thomas H. Wood, Holmdel, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 12, 1989, Ser. No. 449,039
Int. Cl.[5] G02F *1/00, 2/00*; H01S *3/00*
U.S. Cl. 455—606 **15 Claims**

1. A network interface unit (NIU) for interfacing an electrical device to an optical network, said NIU comprising:

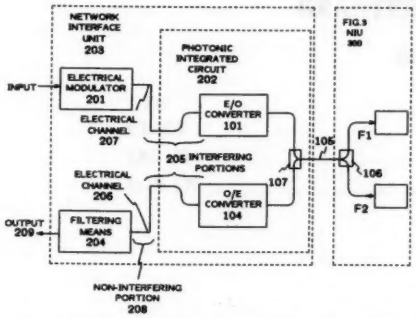
first and second electrical transmission lines (206,207), arranged to effectuate substantial electromagnetic coupling therebetween;

electro-optical converting means (101) connected to said

first electrical transmission line for receiving a first electrical signal and converting the first electrical signal into a first optical signal for transmission to the optical network;

optical-electro converting means (104) for (a) receiving a second optical signal from the optical network, (b) converting said second optical signal into a second electrical signal, and (c) transmitting said second electrical signal via the second electrical transmission line; and

means connected to said second electrical transmission line for increasing a ratio of energy in the second electrical signal to energy electromagnetically coupled from said first electrical transmission line to said second electrical transmission line.



5,005,213

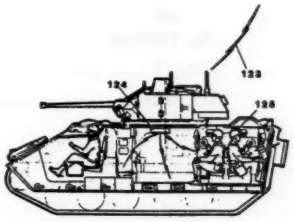
HEAD MOUNTED VIDEO DISPLAY AND REMOTE CAMERA SYSTEM

Charles M. Hanson, Richardson; Vaughn J. Koester, Dallas, and Robert D. Fallstrom, Richardson, all of Tex., assignors to Varo, Inc., Garland, Tex.

Division of Ser. No. 382,243, Jul. 19, 1989, which is a division of Ser. No. 168,137, Mar. 14, 1988, which is a division of Ser. No. 883,994, Jul. 10, 1986, Pat. No. 4,786,966. This application Apr. 11, 1990, Ser. No. 507,978

Int. Cl.[5] **H04B** *10/22;* **H04N** *5/33, 7/18, 7/22*

U.S. Cl. 455—617 **9 Claims**



1. A video system for use with a vehicle, comprising:

a transmitter mounted within said vehicle for omnidirectionally transmitting a video signal of an image through free space within the vehicle; and

a video receiver and display mountable to a person's head for receiving and displaying the image irrespective of the person's location within the vehicle.

DESIGN PATENTS

GRANTED APR. 2, 1991

ERRATA

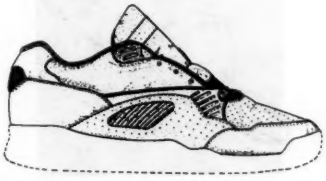
For CLASS	See PATENT NO.
D02-314	315,828
D13-179	315,832

DESIGNS

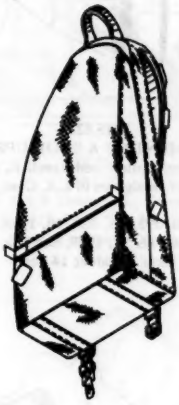
APRIL 2, 1991

315,823
CROSS-COUNTRY MOTORCYCLIST'S BOOT
Dino Signori, Maser, Italy, assignor to SIDI SPORT S.a.s. di Dino Signori & C., Treviso, Italy
Filed May 10, 1988, Ser. No. 192,119
Claims priority, application Italy, Feb. 29, 1988, 20746/88[U]
Term of patent 14 years
U.S. Cl. D2—274

315,824
SHOE UPPER
Peter Backus, Portland, and Craig Feller, Tigard, both of Oreg., assignors to Avia Group International, Inc., Portland, Oreg.
Filed Mar. 28, 1990, Ser. No. 500,272
Term of patent 14 years
U.S. Cl. D2—314



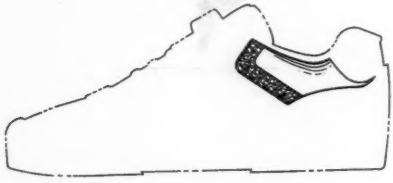
315,825
BACKPACK
Anthony Hutton, Bedford, England; Phillip A. Straughan, Mount Vernon, N.Y.; Tiffany A. Norwood, Ft. Washington, Md., and Oliver Pfeffer, Ithaca, N.N.Y., assignors to ToPAQ, Inc., Ithaca, N.Y.
Filed Dec. 4, 1989, Ser. No. 445,475
Term of patent 14 years
U.S. Cl. D3—32



315,826
ACCESSORY CONTAINER FOR A GOLF BAG
Enrico Fumia, Turin, Italy, assignor to Pininfarina Extra S.r.l., Turin, Italy
Filed Dec. 15, 1987, Ser. No. 133,454
Claims priority, application Italy, Jun. 15, 1987, 53424/87[U]
Term of patent 14 years
U.S. Cl. D3—37

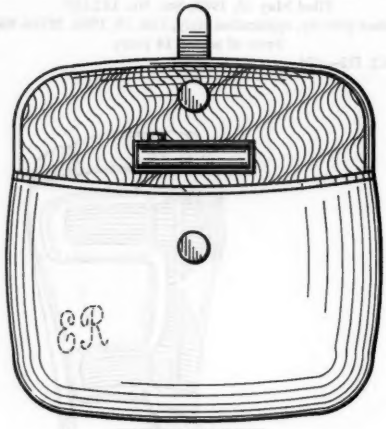
315,827
SOFT LUGGAGE CASE
William L. King, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.
Filed Sep. 25, 1987, Ser. No. 101,331
Term of patent 14 years
U.S. Cl. D3—71

315,828
ELEMENT OF A SHOE UPPER
Larry M. Clark, Simi Valley, and Janell E. Magdaleno, Rosemead, both of Calif., assignors to L.A. Gear, Inc., Los Angeles, Calif.
Division of Ser. No. 295,561, Jan. 10, 1989, abandoned. This application Feb. 27, 1989, Ser. No. 315,778
Term of patent 14 years
U.S. Cl. D2—314

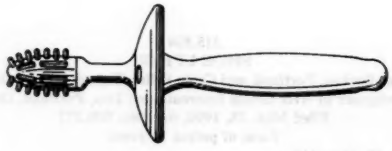


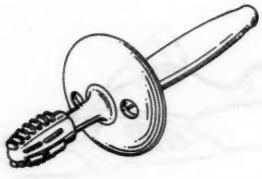
315,829
WATER PURIFYING CANTEEN
Melvin R. Covington, 3711 N. 75th St., Scottsdale, Ariz. 85251
Filed Mar. 12, 1987, Ser. No. 24,809
Term of patent 14 years
U.S. Cl. D3—30.1

315,830
LIGHTED HANDBAG
Ellen Roberts, 541 Walnut St., Apt. B7, Elizabeth, N.J. 07201
Filed Feb. 19, 1988, Ser. No. 157,521
Term of patent 14 years
U.S. Cl. D3—52

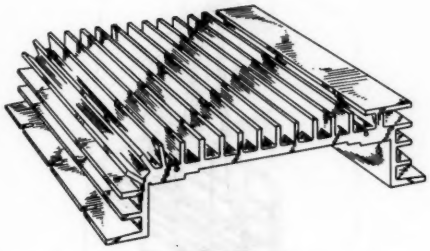


315,831
TOOTHBRUSH
Yusuke Kawano, Tokyo, Japan, assignor to Pigeon Co., Ltd., Tokyo, Japan
Filed Dec. 6, 1988, Ser. No. 280,728
Claims priority, application Japan, Jun. 6, 1988, 63-22113
Term of patent 14 years
U.S. Cl. D4—104

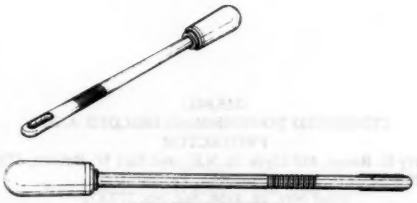




315,832
HEAT SINK
George A. Rocheleau; Michael C. Graves, both of Mesa, and John France, Phoenix, all of Ariz., assignors to Rockford Corporation, Tempe, Ariz.
Filed Oct. 24, 1988, Ser. No. 261,280
Term of patent 14 years
U.S. Cl. D13—179

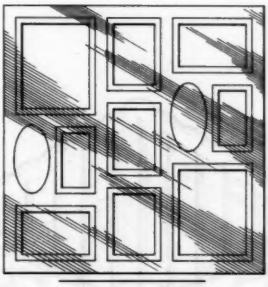


315,833
TOILET BOWL BRUSH HANDLE
William E. Brazis, Medina, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jan. 13, 1989, Ser. No. 297,261
Term of patent 14 years
U.S. Cl. D4—138



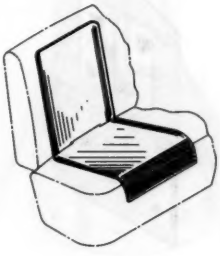
315,834
SCARF
Bruno Gentilli, Come, Italy, assignor to S. T. Dupont, Paris, France
Filed Aug. 17, 1987, Ser. No. 86,654
Claims priority, application France, Mar. 2, 1987, 871172
Term of patent 14 years
U.S. Cl. D5—16

315,835
MAGNETIZED FRAME FOR HOLDING PLURAL PHOTOGRAPHS
Cindy K. Dahlquist, R.R. 3, Box 126, Oakland, Nebr. 68045
Filed Mar. 2, 1988, Ser. No. 162,861
Term of patent 14 years
U.S. Cl. D6—302

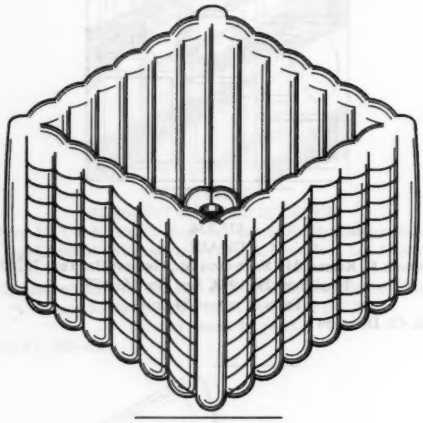


315,836
CHAIR
Kenneth L. Kaiser, 311 S. Denton St., Gainesville, Tex. 76240
Filed Feb. 29, 1988, Ser. No. 161,659
Term of patent 14 years
U.S. Cl. D6—334

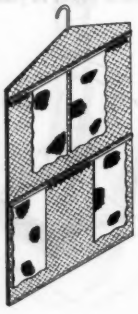
315,837
PROTECTIVE PAD FOR A CAR SEAT
Daniel J. Bernon, 2099 Miramar Blvd., S. Euclid, Ohio 44121
Filed Feb. 8, 1988, Ser. No. 153,023
Term of patent 14 years
U.S. Cl. D6—368



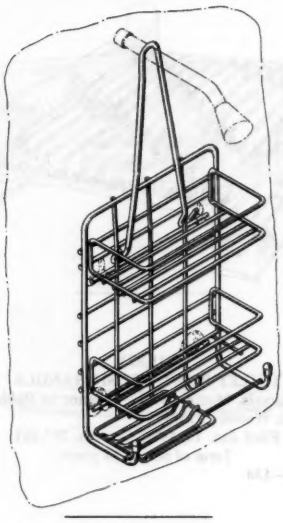
315,838
INFLATABLE CRIB
Robert R. Penrod, 47 McNeil Cir., Marlborough, Mass. 01752
Filed Feb. 8, 1988, Ser. No. 153,793
Term of patent 14 years
U.S. Cl. D6—391



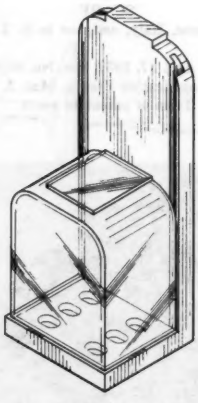
315,839
JEWELRY, TRINKET AND ACCESSORY ORGANIZER
Ellen Martorella, 11643 Sunshine Pond Rd., Tampa, Fla. 33635
Filed Aug. 6, 1990, Ser. No. 562,950
Term of patent 14 years
U.S. Cl. D6—513



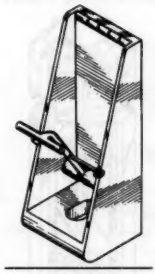
315,840
SHOWER CADDY
William W. Emery, Berkeley Heights, N.J., assignor to Better Sleep Manufacturing Co., Berkeley Heights, N.J.
Filed Sep. 14, 1989, Ser. No. 407,022
Term of patent 14 years
U.S. Cl. D6—525



315,841
COMBINED TOOTHBRUSH HOLDER AND PROTECTOR
Larry G. Roope, 413 Clyde St. N.E., and Earl W. Bobbitt, 1728 20th St. N.E., both of Roanoke, Va. 24012
Filed Nov. 18, 1988, Ser. No. 272,873
Term of patent 14 years
U.S. Cl. D6—528

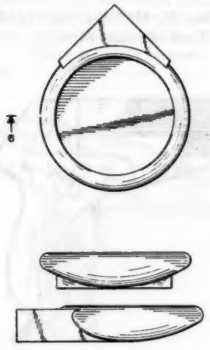


315,842
TOOTHPASTE DISPENSER
Larry E. Tallman, P.O. Box 42, North Hyde Park, Vt. 05665
Filed Mar. 27, 1989, Ser. No. 329,089
Term of patent 14 years
U.S. Cl. D6—541

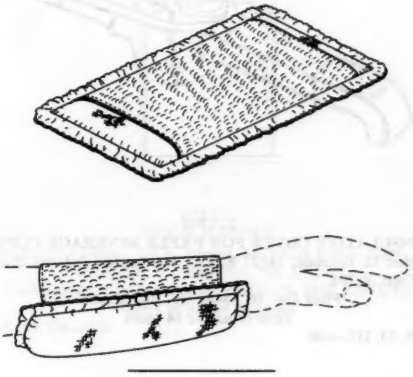


315,843
POUCH CONTAINING LIQUID SOAP OR THE LIKE FOR USE WITH A DISPENSER UNIT
Peter Thomsen, 100 N. Hill Dr. No. 28, Brisbane, Calif. 94005
Continuation-in-part of Ser. No. 807,293, Dec. 10, 1985. This application May 25, 1989, Ser. No. 356,405
Term of patent 14 years
U.S. Cl. D6—542

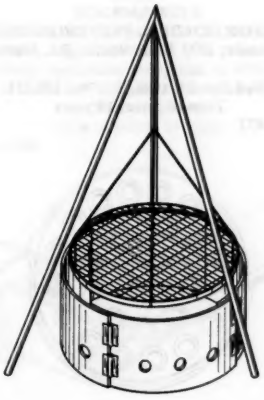
315,844
WALL-MOUNTED SHELF OR THE LIKE
Axel Enthoven, Wijnegem, Belgium, assignor to American Standard Inc., New York, N.Y.
Filed Oct. 19, 1987, Ser. No. 111,521
Term of patent 14 years
U.S. Cl. D6—574



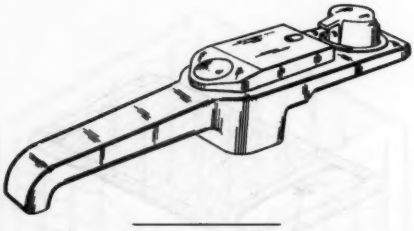
315,845
NURSING PILLOW
Linda S. Lafley, 12006 Blair Meadow, Stafford, Tex. 77477
Filed Jan. 5, 1989, Ser. No. 293,904
Term of patent 14 years
U.S. Cl. D6—601



315,846
COMBINED HOT PIT AND GRILL
Garold E. Hatzenbeller, 1520 Madison Ave., So. Milwaukee, Wis. 53172
Filed May 18, 1988, Ser. No. 195,176
Term of patent 14 years
U.S. Cl. D7—335



315,847
HANDLE FOR A PRESSURE COOKER
Christian Sebillotte, Selongey, France, assignor to SEB, Selongey, France
Continuation of Ser. No. 817,574, Jan. 10, 1986, abandoned. This application Oct. 7, 1988, Ser. No. 256,076
Claims priority, application France, Jul. 17, 1985, 853420
Term of patent 14 years
U.S. Cl. D7—393

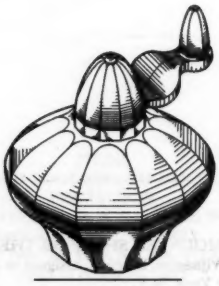


315,848
INSULATIVE COVER FOR PAPER BEVERAGE CUPS
Arthur G. Guzman, 14527 E. Los Angeles St., Baldwin Park, Calif. 91706
Filed Jan. 10, 1989, Ser. No. 295,469
Term of patent 14 years
U.S. Cl. D7—608

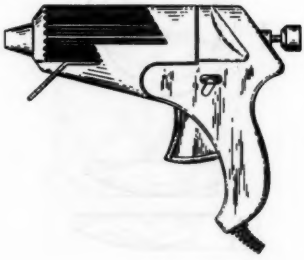
315,849
TRAY FOR HOLDING PEPPERONI SLICES
Donald A. Brunner, 2073 Kratz Station Rd., Harleysville, Pa. 19438
Filed Jun. 24, 1988, Ser. No. 190,231
Term of patent 14 years
U.S. Cl. D7—672

315,850
PEPPER MILL
J. T. Wu, No. 25, Hsin Ye Road, Tainan, Taiwan
Filed Oct. 24, 1988, Ser. No. 261,181
Term of patent 14 years
U.S. Cl. D7—679

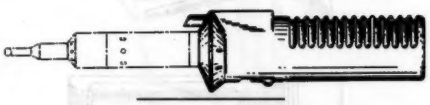
315,851
MILL
J. T. Wu, No. 25, Hsin Ye Road, Tainan, Taiwan
Filed Oct. 24, 1988, Ser. No. 261,478
Term of patent 14 years
U.S. Cl. D7—679



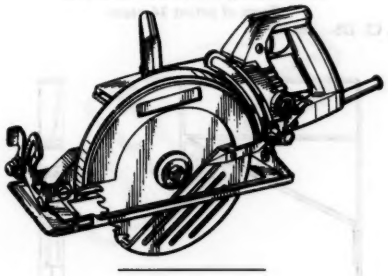
315,852
HOT MELT DISPENSER
Oktavio K. Nüsse, and Wolf-Dieter Krause, both of Münster, Fed. Rep. of Germany, assignors to Bostik, Inc., Middletown, Mass.
Filed Sep. 25, 1987, Ser. No. 101,334
Term of patent 14 years
U.S. Cl. D8—30



315,853
HANDLE FOR A SOLDERING IRON
Thaddeus Zaborowski, and Alan MacLeod, both of Cambridge, Mass., assignors to The Schawbel Corporation, Cambridge, Mass.
Division of Ser. No. 228,960, Jul. 25, 1988. This application Dec. 6, 1988, Ser. No. 280,532
Term of patent 14 years
U.S. Cl. D8—30



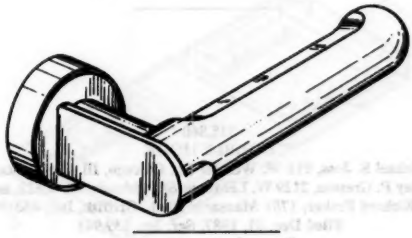
315,854
ELECTRIC SAW
Hideki Kawakami, Hiroshima, and Kiyoshi Hoshino, Tokyo, both of Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Oct. 1, 1987, Ser. No. 103,568
Claims priority, application Japan, Apr. 2, 1987, 62-12900
Term of patent 14 years
U.S. Cl. D8—66



315,855
PORTABLE ELECTRIC WRENCH
Fusao Fushiya, and Shigeki Yamauchi, both of Anjo, Japan, assignors to Makita Electric Works, Ltd., Japan
Filed May 12, 1988, Ser. No. 192,899
Claims priority, application Japan, Nov. 12, 1987, 62-46350
Term of patent 14 years
U.S. Cl. D8—68

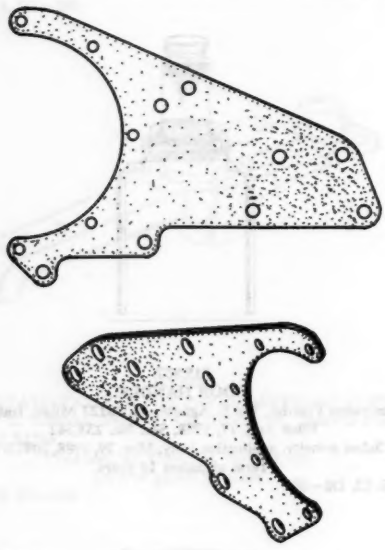
315,856
HOOP CUTTER
Seiji Tokukatsu, 25-8 Nishiarai 5 chome, Adachi-ku, Tokyo, Japan
Filed May 9, 1988, Ser. No. 192,597
Claims priority, application Japan, Nov. 16, 1987, 62-46869
Term of patent 14 years
U.S. Cl. D8—98

315,857
DOOR HANDLE
Gianfranco Frattini, Via S. Agnese, 14, 20123 Milan, Italy
Filed Aug. 17, 1988, Ser. No. 233,342
Claims priority, application Italy, Mar. 29, 1988, 20973/88[U]
Term of patent 14 years
U.S. Cl. D8—308



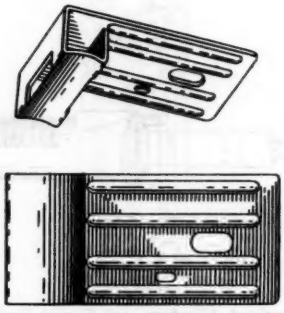
315,858
DOOR HANDLE
Gianfranco Frattini, Via S. Agnese, 14, 20123 Milan, Italy
Filed Aug. 17, 1988, Ser. No. 233,344
Claims priority, application Italy, Mar. 4, 1988, 2079/88[U]
The portion of the term of this patent subsequent to Apr. 2, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—308

315,859
BRACKET
Francis G. Carroll, 40 Main St., Apt. 2C, Butler, N.J. 07405
Filed Sep. 28, 1988, Ser. No. 250,426
Term of patent 14 years
U.S. Cl. D8—357

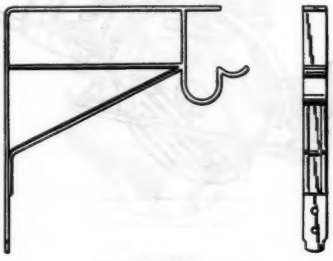


315,860
DOUBLE HOOK
Michael S. Joss, 911 W. Webster St., Chicago, Ill. 60614; Stanley P. Gresens, 2129 W. LeMoyne St., Chicago, Ill. 60622, and Richard Fraker, 1751 Mansards Blvd., Griffith, Ind. 46319
Filed Dec. 31, 1987, Ser. No. 139,941
Term of patent 14 years
U.S. Cl. D8—367

315,861
SUPPORT STRAP BRACKET
Isaac Sachs, 1240 Ridgewood Drive, Chomedey, Laval, Quebec, Canada H7W 1L3
Filed Dec. 23, 1987, Ser. No. 137,005
Term of patent 14 years
U.S. Cl. D8—371



315,862
CLOSET POLE HANGER
Lewis Specker, Jr., 10 Via Cheparro, Greenbrae, Calif. 94904
Filed Dec. 14, 1988, Ser. No. 284,866
Term of patent 14 years
U.S. Cl. D8—380



315,863
PIPE HOLDER
Lee Shui-Mu, No. 160, Sec. 1, Tai Yuan Rd., Taichung, Taiwan
Filed Jul. 6, 1990, Ser. No. 548,774
Term of patent 14 years
U.S. Cl. D8—380

315,864

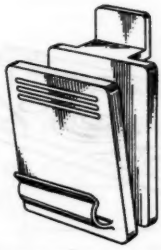
CLIP HOOK FOR PERFORATE SUPPORTS

Donald Embree, Copley, and Stanley A. Mathey, Orrville, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio

Filed Jul. 1, 1988, Ser. No. 214,634

Term of patent 14 years

U.S. Cl. D8—395



315,865

BOAT COVER CLIP

Brahm Fisscher, Atlanta, Ga., assignor to Pawly Industries Corporation, Atlanta, Ga.

Filed Jul. 28, 1989, Ser. No. 387,100

Term of patent 14 years

U.S. Cl. D8—395

315,866

CONTAINER FOR CONFECTIONERY PRODUCTS

Pietro Ferrero, Genese, Belgium, assignor to Ferrero Ardennes S.A., Arlon, Belgium

Filed Sep. 23, 1988, Ser. No. 249,163

Claims priority, application Italy, Mar. 24, 1988, 53009/88[U]

Term of patent 14 years

U.S. Cl. D9—318

315,867

DUAL COMPARTMENT BOTTLE

Borge Hestehave, Alta Loma, and Kjeld Hestehave, Upland, both of Calif., assignors to Bomatic, Inc., Ontario, Calif.

Filed Jul. 7, 1987, Ser. No. 70,525

Term of patent 14 years

U.S. Cl. D9—341

315,868

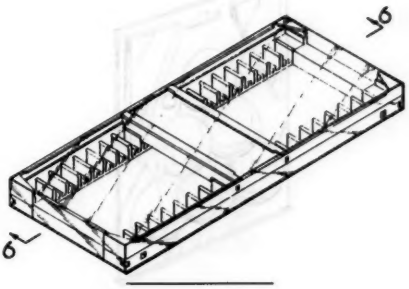
COMBINATION DISPLAY PACKAGE AND FLIP FILE HOLDER FOR COMPACT DISC BOXES

Paul J. Gelardi; Anthony L. Gelardi, both of Cape Porpoise, Me.; Alan B. Lowry, Canton, Mass.; Craig S. Lovecky, Old Orchard Beach, Me., and Richard H. Farr, Woburn, Mass., assignors to Shape Inc., Biddeford, Me.

Filed Apr. 8, 1988, Ser. No. 179,134

Term of patent 14 years

U.S. Cl. D9—341



315,869

CONTAINER BODY FOR LIQUIDS OR THE LIKE

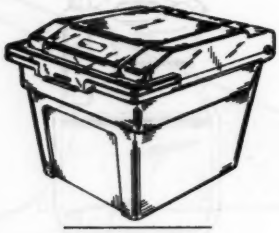
Wayne N. Collette, Merrimack, N.H., assignor to Continental PET Technologies, Inc., Norwalk, Conn.

Filed Jan. 11, 1989, Ser. No. 295,849

Term of patent 14 years

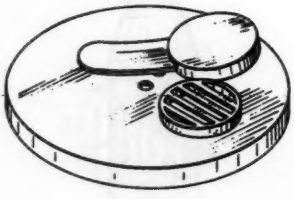
U.S. Cl. D9—392

315,870
STORAGE BOX WITH HINGED LID
Thomas E. Perdue, Jr., 414 Spruce La., Crystal Lake, Ill. 60014, and Jeffrey D. Bransky, 233 S. Kensington, La Grange, Ill. 60525
Filed Jul. 18, 1988, Ser. No. 221,561
Term of patent 14 years
U.S. Cl. D9—420

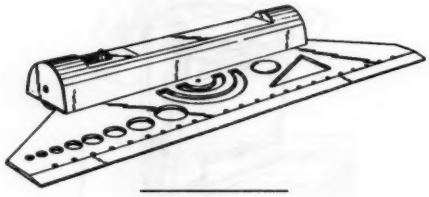


315,871
PACKAGE
David Whitebread, Harpenden, England, assignor to M.Y. Sports & Games Ltd., England
Filed Feb. 23, 1989, Ser. No. 314,600
Claims priority, application United Kingdom, Aug. 26, 1988, 1,053,264
Term of patent 14 years
U.S. Cl. D9—415

315,872
CLOSURE FOR A BEVERAGE CAN
Cynthia C. Bixler, Chillicothe, Ohio, assignor to CinTom, Inc., Carmel, Ind.
Filed Nov. 14, 1988, Ser. No. 270,118
Term of patent 14 years
U.S. Cl. D9—446



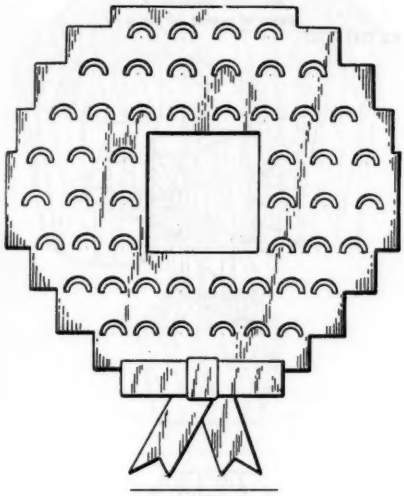
315,873
ROLLING RULER
Adam T. Laws, Balmain East, Australia, assignor to James Gregory McLaughlin, Queensland, Australia
Filed Nov. 18, 1988, Ser. No. 273,431
Claims priority, application Australia, May 20, 1988, 1629/88
Term of patent 14 years
U.S. Cl. D10—62



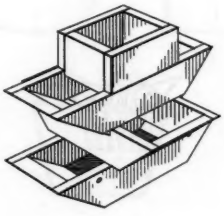
315,874
COMBINED FLASHING LIGHTS & TRAFFIC CONE
Jack A. DeCaro, 1109 N. Jackson, Tacoma, Wash. 98406
Filed May 13, 1988, Ser. No. 193,648
Term of patent 14 years
U.S. Cl. D10—114

315,875
BROOCH
Paolo Bulgari, Rome, Italy, assignor to Partecipazione Bulgari S.p.A., Rome, Italy
Filed Jul. 13, 1988, Ser. No. 218,043
Claims priority, application Int'l Pat. Institute, Jan. 14, 1988, DM/010065
Term of patent 14 years
U.S. Cl. D11—43

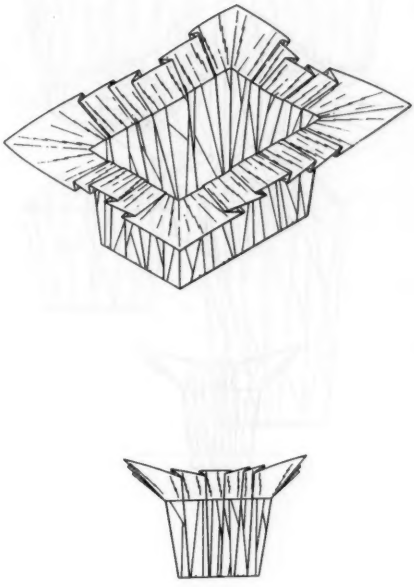
315,876
HOLDER FOR GREETING CARDS
Frank J. Vernon, 16 Powell Rd., Emerson, N.J. 07630
Filed Jan. 4, 1988, Ser. No. 140,417
Term of patent 14 years
U.S. Cl. D11—120



315,877
MULTI-TIER PLANTER UNIT
Kelley M. Hedges, 825 N. Buchanan, Escondido, Calif. 92027
Filed Jan. 19, 1988, Ser. No. 145,243
Term of patent 14 years
U.S. Cl. D11—143



315,878
FLOWER POT COVER
Donald E. Weder; Erwin H. Weder, both of Highland, Ill.; Wanda M. Weder, Highland, Calif.; Franklin J. Craig, Valley Park, Mo.; Wilma M. Donnelly, Highland, Ill.; Phyllis J. Bolk, Highland, Ill.; John W. Bergstrand, Highland, Ill., and Robert C. Abrams, Edwardsville, Ill., assignors to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 613,053, May 22, 1984, Pat. No. D. 293,224. This application Oct. 13, 1987, Ser. No. 107,802
The portion of the term of this patent subsequent to Apr. 2, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—164



315,879

FLOWER POT COVER

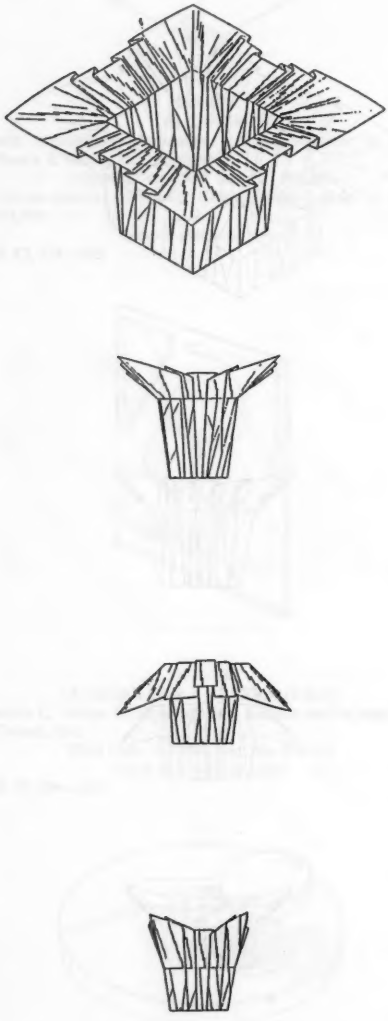
Donald E. Weder; Erwin H. Weder, both of Highland, Ill.; Wanda M. Weder, Highland, Calif.; Franklin J. Craig, Valey Park, Mo.; Wilma M. Donnelly, Highland; Phyllis J. Bolk, Highland; John W. Bergstrand, Highland, and Robert C. Abrams, Edwardsville, all of Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 613,053, May 22, 1984, Pat. No. D. 293,224. This application Oct. 13, 1987, Ser. No. 108,320

The portion of the term of this patent subsequent to Apr. 2, 2005, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164



315,880

FLOWER POT COVER

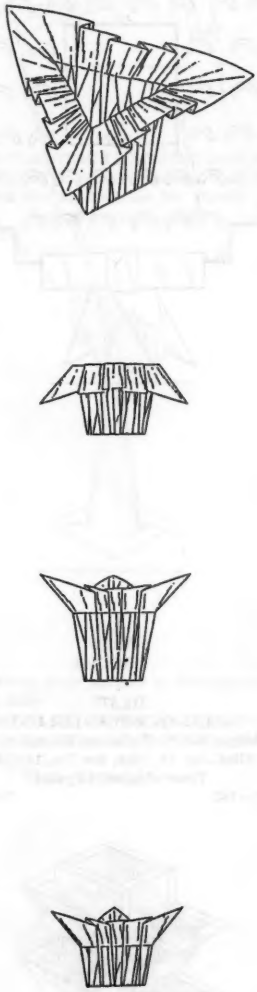
Donald E. Weder; Erwin H. Weder, both of Highland, Ill.; Wanda M. Weder, Highland, Calif.; Franklin J. Craig, Valley Park, Mo.; Wilma M. Donnelly, Highland, Ill.; Phyllis J. Bolk, Highland, Ill.; John W. Bergstrand, Highland, Ill., and Robert C. Abrams, Edwardsville, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 613,053, May 22, 1984, Pat. No. Des. 293,224. This application Oct. 13, 1987, Ser. No. 108,309

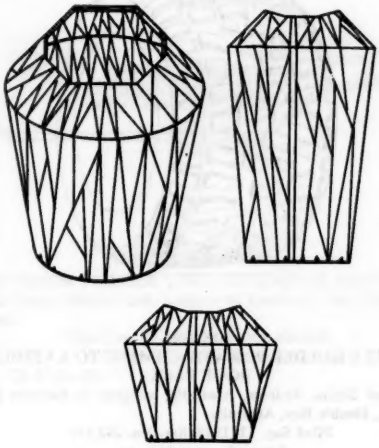
The portion of the term of this patent subsequent to Apr. 2, 2005, has been disclaimed.

Term of patent 14 years

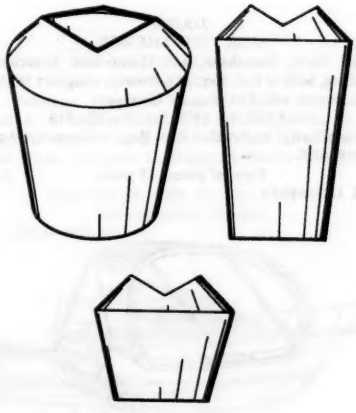
U.S. Cl. D11—164



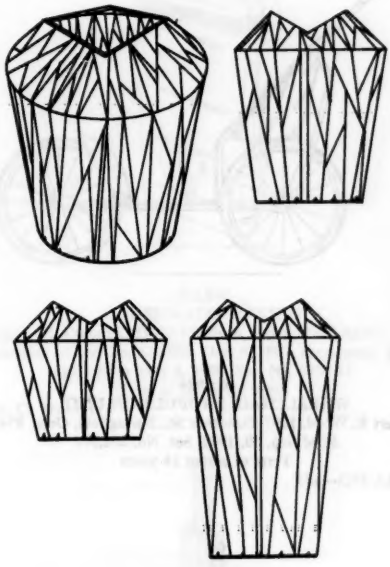
315,881
FLOWER POT COVER
Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.
Filed Mar. 9, 1989, Ser. No. 321,459
The portion of the term of this patent subsequent to Apr. 2, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—164



315,882
FLOWER POT COVER
Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.
Filed Mar. 9, 1989, Ser. No. 321,466
The portion of the term of this patent subsequent to Apr. 2, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—164

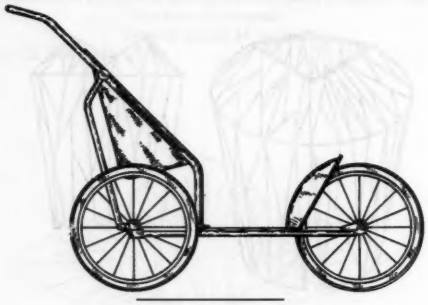


315,883
FLOWER POT COVER
Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.
Filed Mar. 9, 1989, Ser. No. 321,467
The portion of the term of this patent subsequent to Apr. 2, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—164



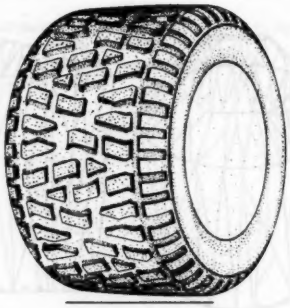
315,884
VERTICAL SUPPORTER FOR CHILD OR THE LIKE
Mac L'Dean Baker, Bakersfield, Calif., assignor to Mobility Options Research Foundation, Bakersfield, Calif.
Filed Sep. 14, 1987, Ser. No. 96,835
Term of patent 14 years
U.S. Cl. D12—128

315,885
INFANT STROLLER
Richard H. Jacobs, Roseville, Minn., assignor to Tri Industries, Inc., Hopkins, Minn.
Filed Nov. 27, 1989, Ser. No. 441,933
Term of patent 14 years
U.S. Cl. D12—129

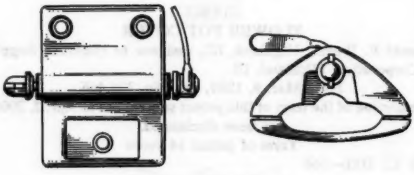


315,886
WHEELCHAIR PROPULSION UNIT
Herbert E. Wood, 1397 Tamarack St., Springfield, Oreg. 97477
Filed Sep. 30, 1988, Ser. No. 252,871
Term of patent 14 years
U.S. Cl. D12—133

315,887
VEHICLE TIRE
Hisashi Shintomi, Osaka, Japan, assignor to The Ohtsu Tire & Rubber Co., Ltd., Osaka, Japan
Filed Mar. 15, 1988, Ser. No. 170,974
Claims priority, application Japan, Sep. 16, 1987, 62-37906
Term of patent 14 years
U.S. Cl. D12—136

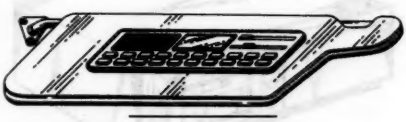


315,888
BICYCLE HOLDER FOR ATTACHMENT TO A VEHICLE ROOF RACK
Michael Dixon, Ardross, Australia, assignor to Samrein Pty Ltd., Double Bay, Australia
Filed Sep. 12, 1988, Ser. No. 243,491
Term of patent 14 years
U.S. Cl. D12—157

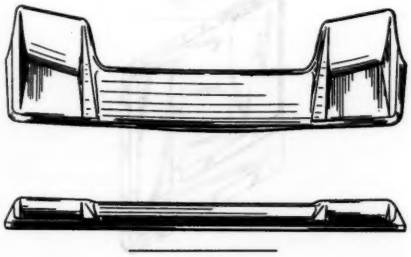


315,889
SIDE VIEW MIRROR
Hermann Burst, Rutesheim, and Heinz-Arno Kruschhausen, Leonberg, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsch AG, Fed. Rep. of Germany
Filed Feb. 10, 1988, Ser. No. 154,616
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1987, MR 6302
Term of patent 14 years
U.S. Cl. D12—187

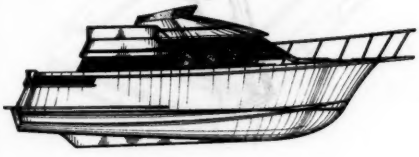
315,890
COMBINED VEHICLE SUN VISOR AND CELLULAR TELEPHONE UNIT
Joe Lewo, P.O. Box N8913, Nassau, The Bahamas
Filed Apr. 29, 1988, Ser. No. 187,999
Term of patent 14 years
U.S. Cl. D12—191



315,891
EXTERIOR VEHICLE VISOR OR SIMILAR ARTICLE
Paul Down, Elkhart, Ind., assignor to Kemberly, Inc., Elkhart, Ind.
Filed Jan. 30, 1989, Ser. No. 304,016
Term of patent 14 years
U.S. Cl. D12—191

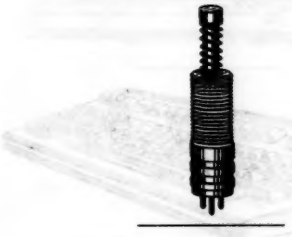


315,892
YACHT
R. M. Tollefson, Edmonds; Dane A. Armstrong, Longview; David A. LeMonds; Douglas J. Wakefield, both of Kelso; Walter F. Altmann, Longview, and Marcel L. LaFond, Kelso, all of Wash., assignors to Tollycraft Yachts Corp., Seattle, Wash.
Filed Nov. 30, 1989, Ser. No. 444,604
Term of patent 14 years
U.S. Cl. D12—315

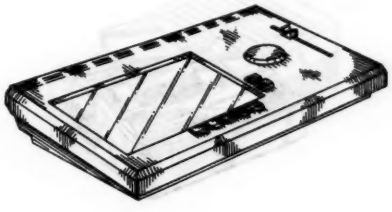


315,893
HEAVY DUTY, REMOTELY CONTROLLED TIMER SWITCH
Willis Cheng, Taipei, Taiwan, assignor to Woods Far East, Inc., Taiwan
Filed Jul. 11, 1988, Ser. No. 216,976
Term of patent 14 years
U.S. Cl. D13—165

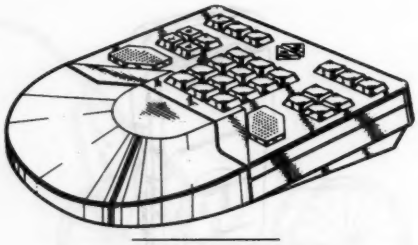
315,894
UNDERWATER SWITCH
Gabriel M. Giannini, 51555 Madison, Indio, Calif. 92201
Division of Ser. No. 132,056, Dec. 9, 1987, abandoned. This application May 8, 1990, Ser. No. 520,611
Term of patent 14 years
U.S. Cl. D13—171



315,895
CONSOLE FOR DATA INPUT/OUTPUT TABLET
Stephen H. Paine, and Carl Schofield, both of London, Great Britain, assignors to Syco Systems Ltd., London, United Kingdom
Filed Jan. 25, 1988, Ser. No. 148,271
Claims priority, application Bulgaria, Jul. 23, 1987, 1043645; United Kingdom, Jul. 23, 1987, 1043646; Jul. 23, 1987, 1043647; Jul. 23, 1987, 1043648
Term of patent 14 years
U.S. Cl. D14—100

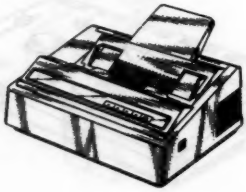


315,896
KEYPAD
Michael Brown, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Apr. 20, 1989, Ser. No. 341,104
Term of patent 14 years
U.S. Cl. D14—100

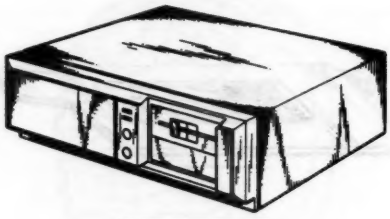


315,897
KEYBOARD
Robert T. Faranda, Acton, Mass., and Steven D. Kim, New York, N.Y., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed May 26, 1989, Ser. No. 358,602
Term of patent 14 years
U.S. Cl. D14—100

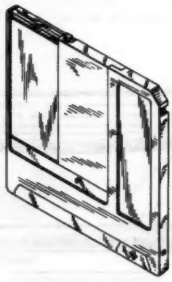
315,898
PAGE SCANNER
Yoshikazu Hokura, Kanagawa; Hironosuke Koda, and Munerori Fujimoto, both of Tokyo, all of Japan, assignors to Matsushita Graphic Communication Systems, Inc., Tokyo, Japan
Filed May 5, 1989, Ser. No. 347,955
Claims priority, application Japan, Nov. 9, 1988, 63-43880
Term of patent 14 years
U.S. Cl. D14—107



315,899
FLOPPY DISK DRIVE UNIT
Yong H. Kim, Kyungki, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Sep. 5, 1989, Ser. No. 402,919
Claims priority, application Rep. of Korea, Mar. 22, 1989, 3489/1989[U]
Term of patent 14 years
U.S. Cl. D14—109

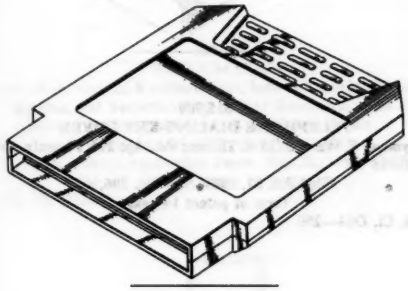


315,900
OPTICAL DISC CARTRIDGE
Hirokimi Iwata, Ina, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Apr. 14, 1989, Ser. No. 337,548
Claims priority, application Japan, Nov. 9, 1988, 63-43946
Term of patent 14 years
U.S. Cl. D14—114

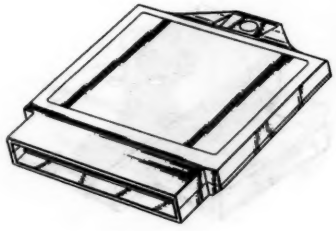


315,901
PORTABLE LASER SCANNER
Carl H. Knowles, Moorestown, N.J., assignor to Metrologic Instruments, Inc., Bellmawr, N.J.
Filed Jan. 30, 1989, Ser. No. 304,310
Term of patent 14 years
U.S. Cl. D14—116

315,902
GAME CARTRIDGE
Yoshiaki Nakauma, Chigasaki, Japan, assignor to Namco, Ltd., Tokyo, Japan
Filed Dec. 15, 1988, Ser. No. 284,481
Term of patent 14 years
U.S. Cl. D14—121

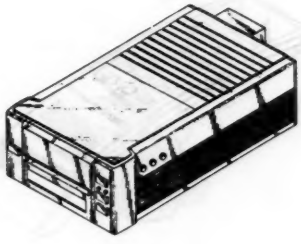


315,903
GAME CARTRIDGE
Yoshiaki Nakauma, Chigasaki, Japan, assignor to Namco, Ltd., Tokyo, Japan
Filed Dec. 15, 1988, Ser. No. 284,482
Term of patent 14 years
U.S. Cl. D14—121

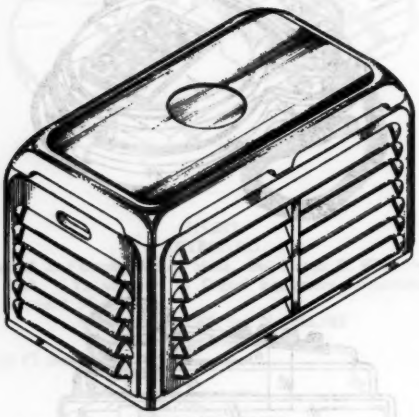


315,904
TELEPHONE SET WITH TRANSPARENT OUTER SURFACE AND NEON-LIGHT TUBE SURROUNDING THE BASE
Thomas Cheng, No. 6, Alley 49, Lane 149, Sec. 3, Nan Kang Rd., Taipei, Taiwan
Filed Sep. 5, 1989, Ser. No. 402,265
Term of patent 14 years
U.S. Cl. D14—150

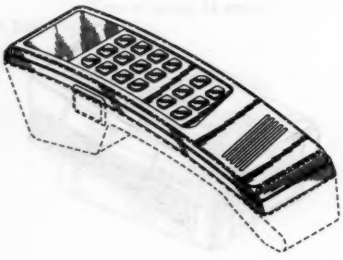
315,905
DIGITAL AUDIO DISC PLAYER
Masafumi Ito, Tokyo; Shigeru Hasegawa, Kodaira; Haruki Takita, and Misoru Sube, both of Hachioji, all of Japan, assignors to Teac Corporation, Musashino, Japan
Filed Feb. 10, 1988, Ser. No. 154,625
Claims priority, application Japan, Aug. 24, 1987, 62-34371
The portion of the term of this patent subsequent to Mar. 26, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—156



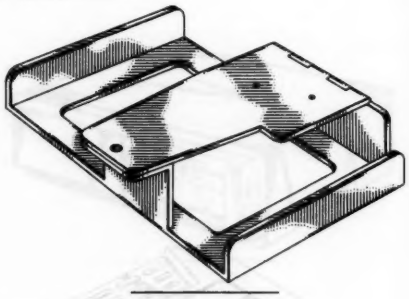
315,906
ALL-WEATHER COVERING FOR CABLE TELEVISION EQUIPMENT
William H. Channell, 122 Oak Tree Dr., Glendora, Calif. 91740
Filed Mar. 31, 1988, Ser. No. 175,725
The portion of the term of this patent subsequent to Oct. 11, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—239



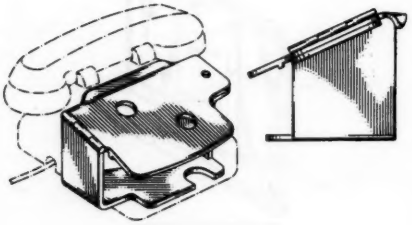
315,907
DIAL TOP-HOUSING FOR TELEPHONE HANDSET OR SIMILAR ARTICLE
Allen Woog, Streamwood; Leonid Soren, Lincolnwood, and Phillip E. Lindeman, Roselle, all of Ill., assignors to Motorola Inc., Schaumburg, Ill.
Filed Nov. 17, 1989, Ser. No. 438,914
Term of patent 14 years
U.S. Cl. D14—247



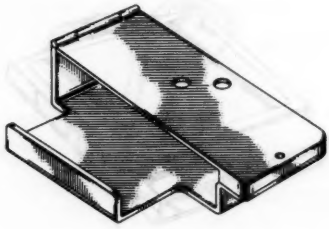
315,908
TELEPHONE DIALING-KEY COVER
Raymond F. Ward, 5225 E. Thomas Rd., Apt. 216, Phoenix, Ariz. 85018
Filed Jul. 31, 1989, Ser. No. 386,964
Term of patent 14 years
U.S. Cl. D14—250



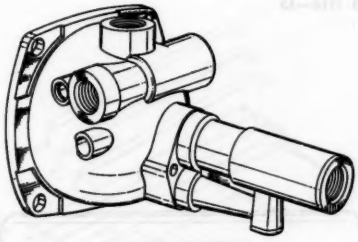
315,909
TELEPHONE DIALING-KEY COVER
Raymond F. Ward, 5225 E. Thomas Rd., Apt 216, Phoenix, Ariz. 85018
Filed Jul. 31, 1989, Ser. No. 386,965
Term of patent 14 years
U.S. Cl. D14—250



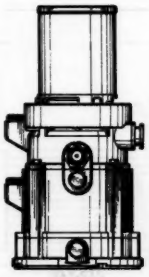
315,910
TELEPHONE DIALING-KEY COVER
Raymond F. Ward, 5225 E. Thomas Rd., Apt 216, Phoenix, Ariz. 85018
Filed Jul. 31, 1989, Ser. No. 386,966
Term of patent 14 years
U.S. Cl. D14—250



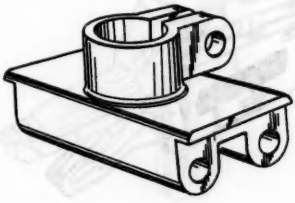
315,911
PUMP HOUSING
Jack F. Campbell, Guelph, Canada, assignor to GSW Inc., Fergus, Canada
Filed Mar. 4, 1988, Ser. No. 163,885
Term of patent 14 years
U.S. Cl. D15—7



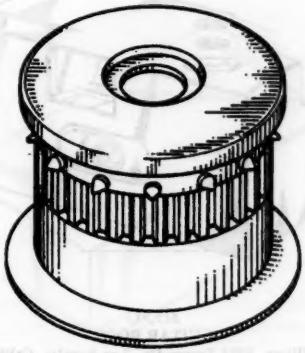
315,912
VACUUM PUMP
Mitsuhiro Nishida; Kozaburo Fujii, both of Fukuoka; Nobuyuki Kondoh, and Yoshinori Abe, both of Kamakura, all of Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan
Filed Mar. 14, 1989, Ser. No. 338,061
Claims priority, application Japan, Sep. 21, 1988, 63-37135
Term of patent 14 years
U.S. Cl. D15—7



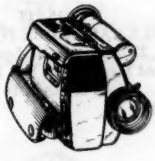
315,913
KNIFE HOLDER FOR TURF AERATION MACHINE
David J. Livingstone, Sylvania Waters, Australia, assignor to Greencare PTY. Limited, Taren Point, Australia
Filed Jun. 11, 1987, Ser. No. 60,435
Claims priority, application Australia, Dec. 17, 1986, 7962/86
Term of patent 14 years
U.S. Cl. D15—28



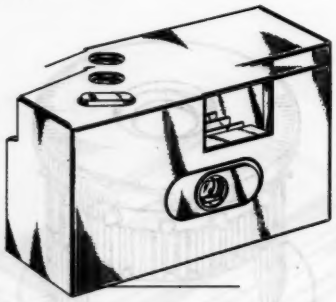
315,914
YARN FEEDER
Jen F. Chen, P.O. Box 1-79, Taipei, Taiwan 10602
Filed May 13, 1988, Ser. No. 193,640
Term of patent 14 years
U.S. Cl. D15—72



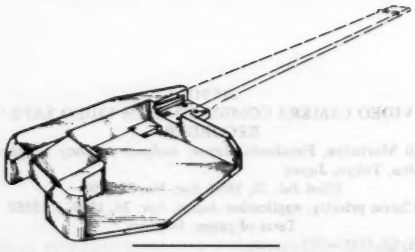
315,915
VIDEO CAMERA COMBINED WITH VIDEO TAPE RECORDER
Yuji Morimiya, Funabashi, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jul. 26, 1989, Ser. No. 385,298
Claims priority, application Japan, Apr. 26, 1989, 1-15558
Term of patent 14 years
U.S. Cl. D16—202



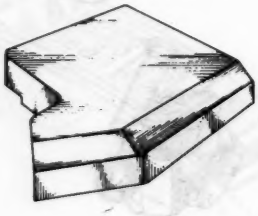
315,916
STILL CAMERA
Bruce A. Leonard, Honeoye Falls, and Deborah N. Pelcher, Rochester, both of N.Y., assignors to Eastman Kodak Compay, Rochester, N.Y.
Filed Jan. 6, 1988, Ser. No. 141,345
Term of patent 14 years
U.S. Cl. D16—218



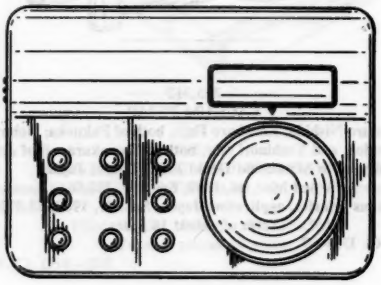
315,917
GUITAR BODY
E. Todd Ellison, 3203 Tareco Dr., Los Angeles, Calif. 90068
Filed Feb. 1, 1988, Ser. No. 150,718
Term of patent 14 years
U.S. Cl. D17—20



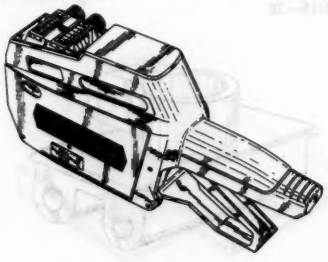
315,918
REMOVABLE CARTRIDGE FOR GUITAR BODY
E. Todd Ellison, 3203 Tareco Dr., Los Angeles, Calif. 90068
Filed Feb. 1, 1988, Ser. No. 150,723
Term of patent 14 years
U.S. Cl. D17—20



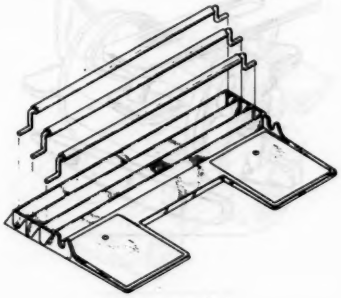
315,919
ELECTRONIC TAPE WRITER
Akira Miyamoto; Tokushige Ohmiya; Genichiro Otani; Setsuo Kawai; Kenji Watanabe; Goro Iijima; Takeshi Matsubara, and Takanobu Kameda, all of Tokyo, Japan, assignors to King Jim Co., Ltd., Japan
Filed Sep. 19, 1988, Ser. No. 246,304
Claims priority, application Japan, Apr. 20, 1988, 63-16032
Term of patent 14 years
U.S. Cl. D18—13



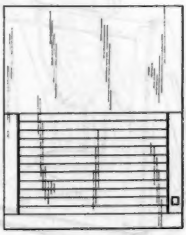
315,920
MANUALLY OPERATED LABELLING GUN
Klaus-Dieter Hermann, Ritterweg 17, D-6932 Hirschhorn, Fed. Rep. of Germany
Filed Sep. 9, 1987, Ser. No. 94,532
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1987, 430
Term of patent 14 years
U.S. Cl. D18—19



315,921
MULTI-FORM FEEDER FOR PRINTER
H. Charles Hassel, Los Angeles, and Donald Westland, Venice, both of Calif., assignors to MicroComputer Accessories, Inc., Los Angeles, Calif.
Filed Oct. 14, 1987, Ser. No. 108,041
Term of patent 14 years
U.S. Cl. D18—22

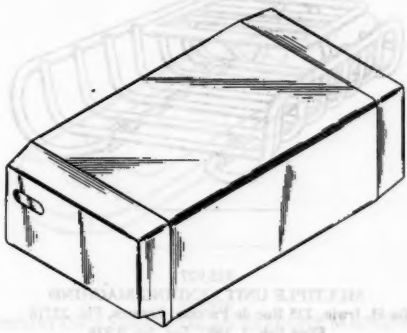


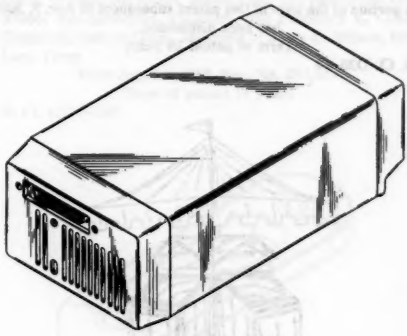
315,922
PAPER SHEET
John M. Giordano, Virginia Beach, Va., assignor to Hunt Holdings, Inc., Wilmington, Del.
Division of Ser. No. 110,956, Oct. 21, 1987. This application May 31, 1990, Ser. No. 532,503
Term of patent 14 years
U.S. Cl. D19—1



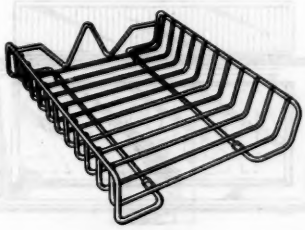
315,923
HAND TOOL HOLDER
Ivar Frischer, Kungsgatan 41, Goteborg, Sweden 411 15
Filed Aug. 20, 1987, Ser. No. 87,445
Claims priority, application Sweden, Feb. 23, 1987, 870388
Term of patent 14 years
U.S. Cl. D19—55

315,924
PORTABLE FILE
James J. Best, Austin, and Margaret C. Sweeney, Georgetown, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed May 27, 1988, Ser. No. 199,550
Term of patent 14 years
U.S. Cl. D19—75

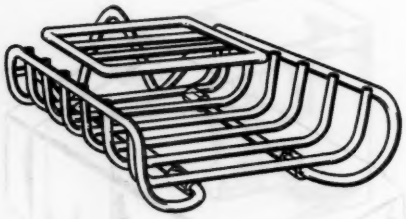




315,925
LETTER TRAY
Beverly C. Rich, Ruxton, Md., assignor to Fellowes Mfg Co, Itasca, Ill.
Filed Mar. 24, 1988, Ser. No. 171,293
Term of patent 14 years
U.S. Cl. D19—92

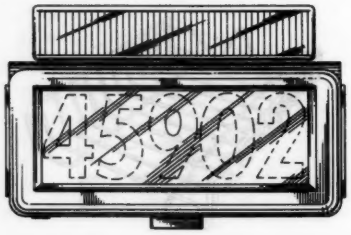


315,926
HOLDER FOR A NOTE PAD OR SIMILAR ARTICLE
Beverly C. Rich, Ruxton, Md., assignor to Fellowes Mfg. Co., Itasca, Ill.
Filed Mar. 24, 1988, Ser. No. 172,348
Term of patent 14 years
U.S. Cl. D19—92

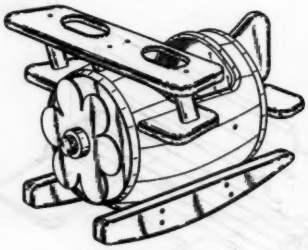


315,927
MULTIPLE UNIT VENDING MACHINE
Eldin H. Irwin, 225 Rue de Paresse, Tavares, Fla. 32778
Filed Feb. 2, 1987, Ser. No. 9,928
The portion of the term of this patent subsequent to Apr. 9, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D20—4

315,928
SOLAR POWERED ILLUMINATED YARD MARKER
Robert A. Flieder, 521 Long La., Huntingdon Valley, Pa. 19006
Filed Nov. 28, 1988, Ser. No. 276,563
Term of patent 14 years
U.S. Cl. D20—17

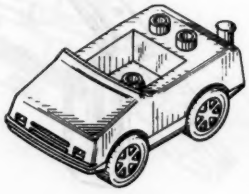


315,929
BI-PLANE ROCKING TOY
Thomas J. Bush, 123 Cherry Brook Rd., Canton Center, Conn. 06020
Filed Dec. 16, 1988, Ser. No. 285,232
Term of patent 14 years
U.S. Cl. D21—68

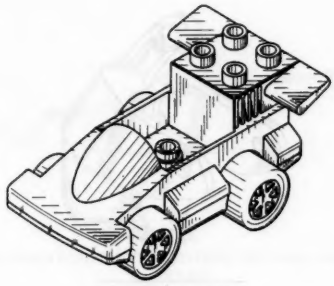


315,930
TOY SWING
Harry S. Thomson, Richmond; David M. Raffo, Gildern Sutton, and John A. Pape, Hitchin, all of England, assignors to Hestair Kiddicraft Limited, Bristol, England
Filed May 19, 1989, Ser. No. 354,678
Term of patent 14 years
U.S. Cl. D21—123

315,931
TOY CAR
Ib H. Berggren, Vedbaek, Denmark, assignor to Interlego AG, Baar, Switzerland
Filed Nov. 29, 1989, Ser. No. 443,231
Term of patent 14 years
U.S. Cl. D21—128

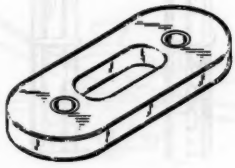


315,932
TOY CAR
Ib H. Berggren, Vedbaek, Denmark, assignor to Interlego AG, Baar, Switzerland
Filed Nov. 29, 1989, Ser. No. 443,233
Term of patent 14 years
U.S. Cl. D21—128

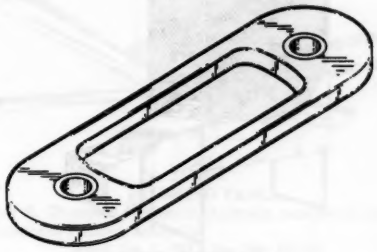


315,933
HULA DOLL
Rak M. Sung, 225 Kaiulani Ave., #505, Honolulu, Hi. 96815
Filed Apr. 14, 1989, Ser. No. 338,139
Term of patent 14 years
U.S. Cl. D21—180

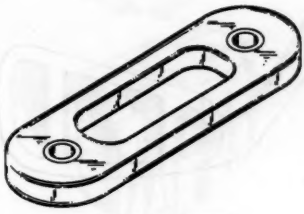
315,934
RESISTANCE STRAP FOR AN EXERCISE MACHINE
Jerry L. Wilson, 16170 SW. Jenne Lake Ct., Beaverton, Oreg. 97006; Jon Schneider, Washington County, and Frederick E. Collins, Lane County, both of Oreg., assignors to Jerry L. Wilson, Hillsboro, Oreg.
Filed Sep. 12, 1988, Ser. No. 243,649
Term of patent 14 years
U.S. Cl. D21—191



315,935
RESISTANCE STRAP FORAN EXERCISE MACHINE
Jerry L. Wilson, 16170 SW. Jenne Lake Ct., Beaverton, Oreg. 97006; Jon Schneider, Hillsboro, and Frederick E. Collins, Cresswell, both of Oreg., assignors to Jerry L. Wilson, Hillsboro, Oreg.
Filed Sep. 12, 1988, Ser. No. 243,650
Term of patent 14 years
U.S. Cl. D21—191



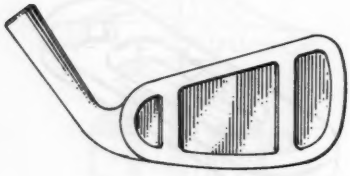
315,936
RESISTANCE STRAP FOR AN EXERCISE MACHINE
Jerry L. Wilson, 16170 SW. Jenne Lake Ct., Beaverton, Oreg. 97006; Jon Schneider, Hillsboro, and Frederick E. Collins, Cresswell, both of Oreg., assignors to Jerry L. Wilson, Hillsboro, Oreg.
Filed Sep. 12, 1988, Ser. No. 243,651
Term of patent 14 years
U.S. Cl. D21—191



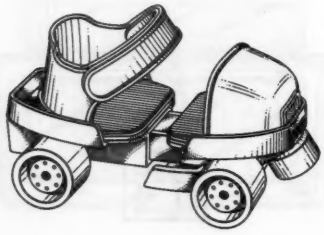
315,937
PHYSICAL EXERCISER
Jack D. Huggins, 212 Country Club Cir., and John Pannell, 11508 Surrey La., both of Midwest City, Okla. 73110
Filed Sep. 13, 1988, Ser. No. 243,670
Term of patent 14 years
U.S. Cl. D21—191

315,938
COMBINED BASKETBALL GAME GOAL AND BALL RETURN
Sondra K. Doyle, P.O. Drawer 49467, Sarasota, Fla. 34230-6467
Filed Nov. 2, 1988, Ser. No. 266,924
Term of patent 14 years
U.S. Cl. D21—201

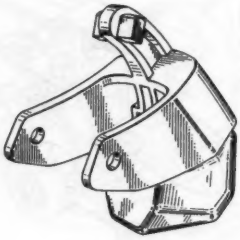
315,939
IRON GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Mar. 4, 1988, Ser. No. 164,001
The portion of the term of this patent subsequent to Mar. 19, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—220



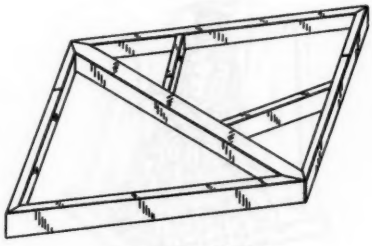
315,940
ROLLER SKATE
Stephen D. Wehmeyer, West Falls, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Aug. 15, 1988, Ser. No. 232,572
Term of patent 14 years
U.S. Cl. D21—226



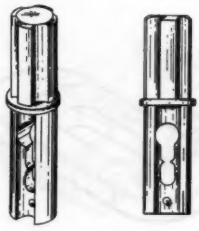
315,941
ROLLER SKATE BRAKE
Brennan J. Olson; Thomas J. Brace, both of Minneapolis, Minn., and Charles R. Frigard, Holland, Mich., assignors to Rollerblade, Inc., Minneapolis, Minn.
Filed Aug. 23, 1989, Ser. No. 397,304
Term of patent 14 years
U.S. Cl. D21—226



315,942
POOL RACK TRIANGLE
Basil Cahill, 7251 Weingartz, Centerline, Mich. 48015
Filed Mar. 7, 1988, Ser. No. 164,643
Term of patent 14 years
U.S. Cl. D21—232

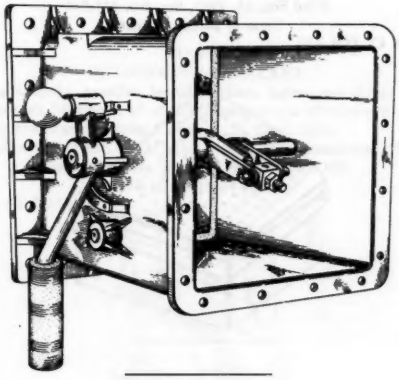


315,943
TENT POLE TIP
Steve C. Heller, Wauconda, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.
Filed Sep. 26, 1988, Ser. No. 250,121
Term of patent 14 years
U.S. Cl. D21—254

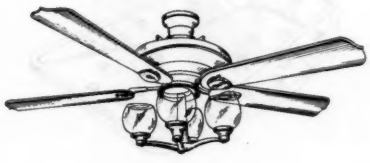


315,944
FISHING ROD OR THE LIKE
Gary J. Gibich, 611 E. 48th, Austin, Tex. 78751
Filed Mar. 18, 1988, Ser. No. 171,511
Term of patent 14 years
U.S. Cl. D22—142

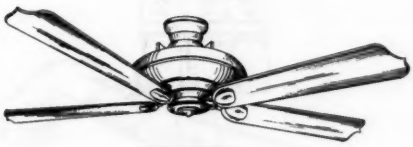
315,945
DUMP VALVE FOR ATTACHMENT TO FIRE ENGINE TANKERS
Theodore Ziaylek, Jr., 140 Riverview Dr., and Michael P. Ziaylek, 3 Brook La., both of Yardley, Pa. 19067
Filed Aug. 7, 1989, Ser. No. 390,912
Term of patent 14 years
U.S. Cl. D23—244



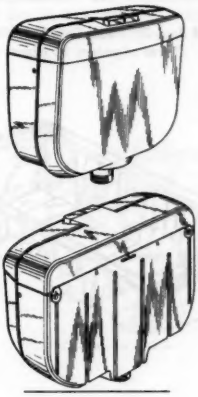
315,946
CEILING FAN AND LIGHT FIXTURE
Richard M. Hollbrook, Hermosa Beach, Calif., assignor to Casablanca Fan Company, Inc., City of Industry, Calif.
Filed Nov. 1, 1988, Ser. No. 265,663
Term of patent 14 years
U.S. Cl. D23—377



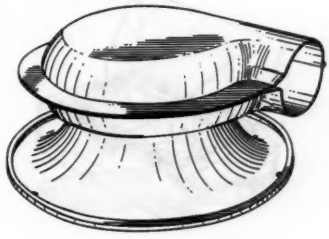
315,947
CEILING FAN
Richard M. Hollbrook, Hermosa Beach, Calif., assignor to Casablanca Fan Company, Inc., City of Industry, Calif.
Filed Nov. 1, 1988, Ser. No. 265,664
Term of patent 14 years
U.S. Cl. D23—377



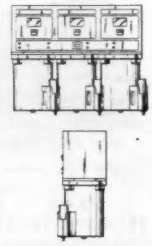
315,948
FLUSHING TANK
Bruce R. Thompson, Tranmere, Australia, assignor to Caroma Industries Limited, Australia
Filed Jun. 5, 1987, Ser. No. 58,378
Claims priority, application Australia, Dec. 10, 1986, 0010/87
Term of patent 14 years
U.S. Cl. D23—313



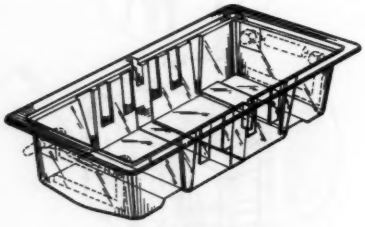
315,949
VENTILATOR
Bengt Sellö, Stockholm, Sweden, assignor to Soft Construction AB, Stockholm, Sweden
Filed Nov. 14, 1989, Ser. No. 436,534
Claims priority, application Sweden, May 23, 1989, 89-1243
Term of patent 14 years
U.S. Cl. D23—393



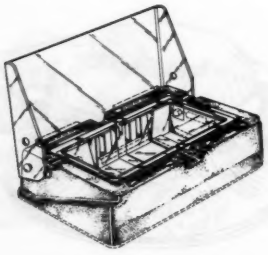
315,950
ANESTHESIA VAPORIZER UNIT
John C. Lundy, Tustin, Calif., assignor to Vaporflow Technology, Inc., Tustin, Calif.
Filed Oct. 9, 1987, Ser. No. 107,517
Term of patent 14 years
U.S. Cl. D24—8



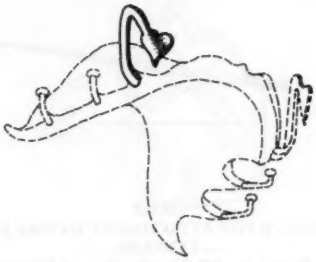
315,951
REACTION TANK FOR ELECTROPHORESIS APPARATUS
Mark Berninger, Gaithersburg, Md., and Michael Schuette, Vienna, Va., assignors to Life Technologies, Inc., Gaithersburg, Md.
Filed Jan. 29, 1988, Ser. No. 149,863
Term of patent 14 years
U.S. Cl. D24—8



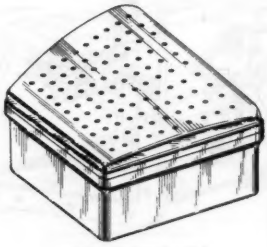
315,952
HORIZONTAL GEL ELECTROPHORESIS UNIT
Mark Berninger, Gaithersburg, Md., and Michael Schuette, Vienna, Va., assignors to Life Technologies, Inc., Gaithersburg, Md.
Filed Jan. 29, 1988, Ser. No. 149,864
Term of patent 14 years
U.S. Cl. D24—8



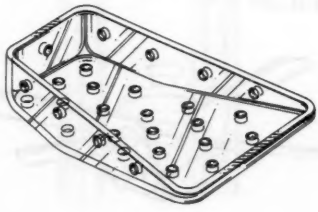
315,953
WIREFORM FOR AN ORTHODONTIC APPLIANCE OR SIMILAR ARTICLE
Ellen M. Moran, 4146 Hyde Park Ct. #H, Indianapolis, Ind., and James M. Moran, Indianapolis, Ind., assignors to Ellen M. Moran, Indianapolis, Ind.
Filed Oct. 27, 1988, Ser. No. 263,337
Term of patent 14 years
U.S. Cl. D24—16



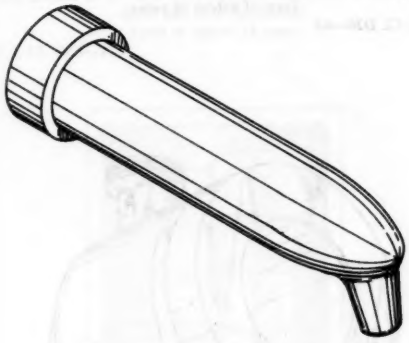
315,954
DENTURE CONTAINER
Maxine L. Berland, 659 Oak St., Lakewood, Colo. 80215
Filed Sep. 16, 1988, Ser. No. 245,544
Term of patent 14 years
U.S. Cl. D24—10



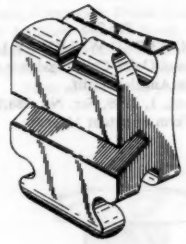
315,955
DENTAL IMPRESSION TRAY FOR SMALL ANIMALS
Lloyd J. Mann, Medford PO Sta. 3, P.O. Box 3503, Medford, Oreg. 97504
Filed Nov. 7, 1988, Ser. No. 267,914
Term of patent 14 years
U.S. Cl. D24—10

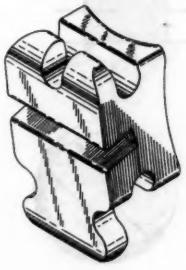


315,956
DENTAL SYRINGE TIP
William B. Dragan, 85 Burr St., Easton, Conn. 06612
Filed Feb. 6, 1989, Ser. No. 306,651
Term of patent 14 years
U.S. Cl. D24—14



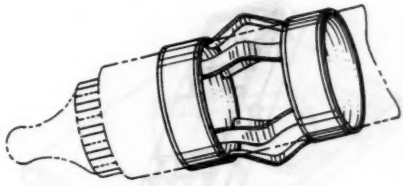
315,957
ORTHODONTIC BRACKET
John S. Kelly, Arcadia; Jerold S. Horn, Azusa; and Jirina V. Pospisil, Monrovia, all of Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 913,188, Sep. 29, 1986, abandoned. This application Nov. 13, 1989, Ser. No. 434,496
Term of patent 14 years
U.S. Cl. D24—16



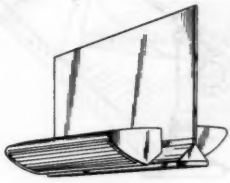


315,958
PHYSIOLOGICAL STIMULATOR
John C. Castel, Topeka, Kans., and Alexander Bally, Pittsburgh, Pa., assignors to Physio Technology, Inc., Topeka, Kans.
Filed Jun. 13, 1988, Ser. No. 207,055
Term of patent 14 years
U.S. Cl. D24—41

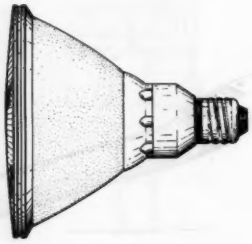
315,959
HANDLE GRIP FOR A BABY BOTTLE
Dona Bilangi, 3320 Ellenboro, Troy, Mich. 48083
Filed Jun. 9, 1989, Ser. No. 365,023
Term of patent 14 years
U.S. Cl. D24—48



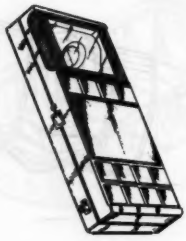
315,960
GLAZED EXTENSION PANEL
Charles Heidmann, Strasbourg, France, assignor to Steelcase Strafor, Strasbour, France
Filed Feb. 22, 1989, Ser. No. 314,419
Claims priority, application France, Aug. 30, 1988, 88 5496
Term of patent 14 years
U.S. Cl. D25—138



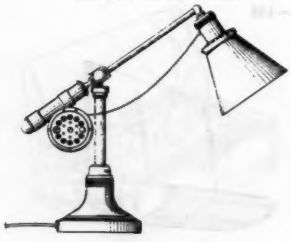
315,961
REFLECTOR LAMP
Carl F. Kackenmeister, and Michael R. Kling, both of Stratham, N.H., assignors to GTE Products Corporation, Danvers, Mass.
Filed Mar. 7, 1990, Ser. No. 490,166
Term of patent 14 years
U.S. Cl. D26—2



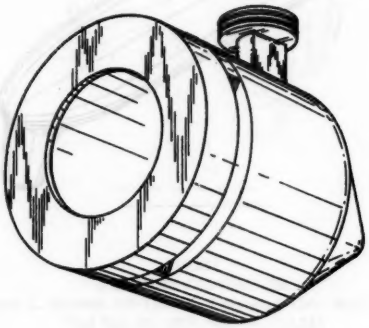
315,962
PORTABLE LIGHT PROJECTOR FOR PRODUCING MULTICOLORED LINE PATTERNS ON A WALL OR THE LIKE IN RESPONSE TO AN AUDIO INPUT SIGNAL
Joshua F. Lavinsky, 350 S. San Fernando Blvd., #301, Burbank, Calif. 91502, and Thomas M. Payne, Burbank, Calif., assignors to Joshua F. Lavinsky, Burbank, Calif.
Filed Mar. 16, 1988, Ser. No. 168,756
Term of patent 14 years
U.S. Cl. D26—24



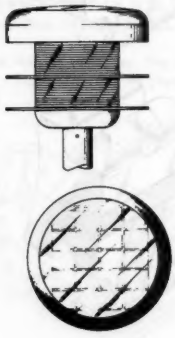
315,963
ADJUSTABLE DESK LAMP
Richard B. Greer, P.O. Box 4005, Carmichael, Calif. 95609
Filed Apr. 3, 1989, Ser. No. 331,899
Term of patent 14 years
U.S. Cl. D26—63



315,964
SPOTLIGHT HOUSING
Stefanus F. Joosten, Eindhoven, and Leonardus A. Krol, Gorichem, both of Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.
Filed May 1, 1989, Ser. No. 345,506
Claims priority, application Netherlands, Nov. 9, 1988, DMA/000.874
Term of patent 14 years
U.S. Cl. D26—63



315,965
SOLAR POWERED WALKWAY LIGHT
John S. Frost, Thousand Oaks, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.
Filed Aug. 1, 1989, Ser. No. 388,227
Term of patent 14 years
U.S. Cl. D26—67



315,966

WIDE ANGLE FRESNEL LENS ARRAY FOR INFRARED MOTION DETECTOR SYSTEM

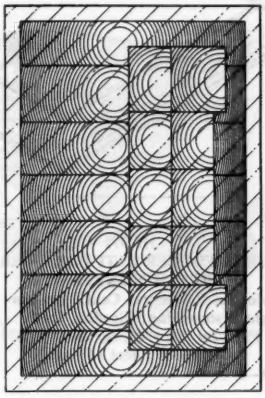
Richard N. Claytor, Arlington, and Russell G. Torti, Fort Worth, both of Tex., assignors to Fresnel Technologies, Inc., Fort Worth, Tex.

Filed Nov. 7, 1988, Ser. No. 267,788

The portion of the term of this patent subsequent to Mar. 12, 2005, has been disclaimed.

Term of patent 14 years

U.S. Cl. D26—122



315,967

HAIR CRIMPING HEAD APPLIANCE

Leandro P. Rizzuto, Greenwich; Frank Lindsey, Stratford, both of Conn., and Anthony Leung, North Point, Hong Kong, assignors to Conair Corporation, Stamford, Conn.

Filed Jul. 27, 1989, Ser. No. 385,485

Term of patent 14 years

U.S. Cl. D28—35

315,968

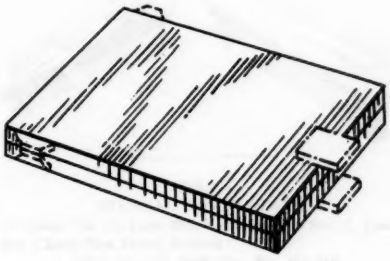
HAIR CRIMPING HEAD APPLIANCE

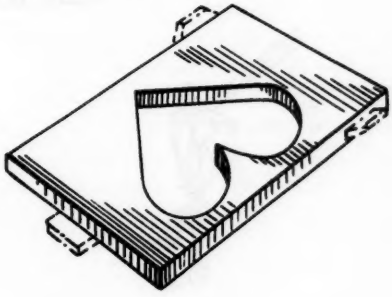
Leandro P. Rizzuto, Greenwich; Frank Lindsey, Stratford, both of Conn., and Anthony Leung, North Point, Hong Kong, assignors to Conair Corporation, Stamford, Conn.

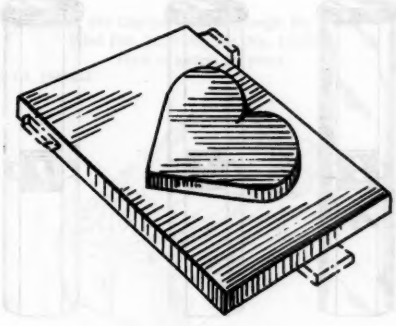
Filed Jul. 27, 1989, Ser. No. 385,790

Term of patent 14 years

U.S. Cl. D28—35

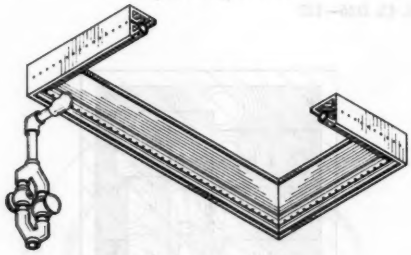






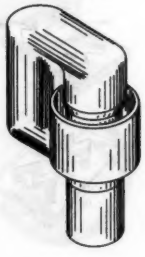
315,969
LIPSTICK CASE
Karen E. McCready, Suffern, N.Y., assignor to Elleance Ltd., New City, N.Y.
Filed Sep. 9, 1988, Ser. No. 242,290
Term of patent 14 years
U.S. Cl. D28—85

315,970
FIRE EXTINGUISHER
Aniano D. Ramos, 38 Passaic Rd., Goose Creek, S.C. 29445, and Wilhelm Gajeton, 5301 Marilyn Dr., Charleston, S.C. 29418
Filed Jun. 22, 1988, Ser. No. 211,397
Term of patent 14 years
U.S. Cl. D29—2

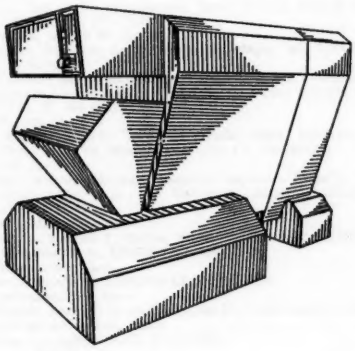


315,971
PRESSURE REDUCER UNIT FOR EMERGENCY BREATHING SYSTEMS
Albert R. Molzan, Alhambra, Calif., assignor to American Safety Flight Systems, Inc., Glendale, Calif.
Filed Jul. 21, 1986, Ser. No. 887,639
Term of patent 14 years
U.S. Cl. D29—6

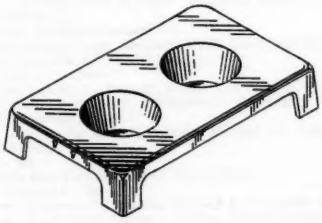
315,972
SNORKEL
Bruce J. Forman, 4455 Jasmine Ave., Culver City, Calif. 90230
Filed Sep. 19, 1988, Ser. No. 245,538
Term of patent 14 years
U.S. Cl. D29—7



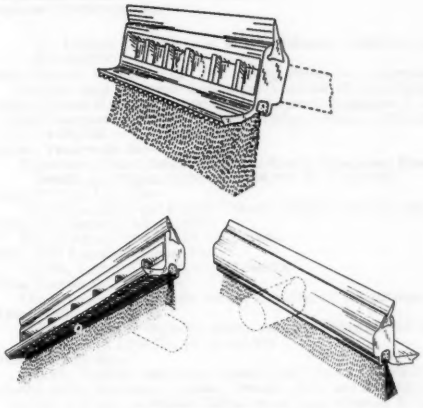
315,973
AUTOMATIC CATTLE FEEDER
Gaetan Beaudoin, Artabaska, and Jacques Cimon, Levis, both of Canada, assignors to Micro-Contact Inc., Quebec, Canada
Filed Mar. 31, 1989, Ser. No. 331,546
Term of patent 14 years
U.S. Cl. D30—122



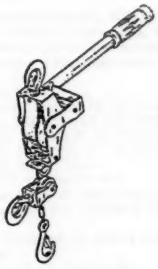
315,974
ANIMAL FEEDING TABLE
Gerald Steiner, 2033 Virginia Ave. South, St. Louis Park, Minn. 55426
Filed Jul. 15, 1988, Ser. No. 219,178
Term of patent 14 years
U.S. Cl. D30—131



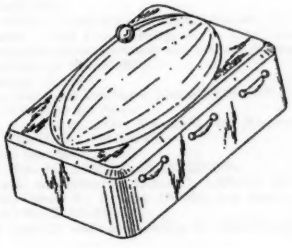
315,975
COMBINED BRUSH HEAD AND SCRAPER
Chii M. Huang, 7 Tuu Kuh North Road, Nan Tzu, POB6-53, Kaohsiung, Taiwan
Filed Jan. 7, 1988, Ser. No. 141,680
Term of patent 14 years
U.S. Cl. D32—41



315,976
MANUAL WINCH DEVICE
Y. S. Shieh, No. 15, Lane 493, Yuan-Chi Rd., Sec. 2, Yuan-Lin Jen, Chang Hua Hsien, Taiwan
Filed May 17, 1988, Ser. No. 194,718
Term of patent 14 years
U.S. Cl. D34—33



315,977
COFFIN
Jerina F. Best, 541 Guylyn Dr., Pittsburgh, Pa. 15235
Filed Feb. 16, 1988, Ser. No. 156,095
Term of patent 14 years
U.S. Cl. D99—1



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF APRIL, 1991

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. O. Smith Corporation: *See—*
King, James L., 5,004,942, Cl. 310-89.000.

ABB Environmental Services Inc.: *See—*
Sublette, Kerry L., 5,004,551, Cl. 210-763.000.

Abbott Laboratories: *See—*
Becker, Wallace E., 5,004,651, Cl. 424-465.000.
Osip, Thomas W.; Montgomery, Jerold W.; and Pezzoli, Paul A., 5,004,110, Cl. 215-232.000.

Abdel-Malik, Magdy M.: *See—*
Yalpani, Manssur; and Abdel-Malik, Magdy M., 5,004,808, Cl. 536-56.000.

Abe, Kunihiro; Sakamoto, Masanori; and Kobayashi, Tomoya, to Fuji Jukogyo Kabushiki Kaisha. Diagnosis system for a motor vehicle. 5,005,129, Cl. 364-424.030.

Abe, Masashi: *See—*
Takayama, Syuichi; Tsukaya, Takashi; Ueda, Yasuhiro; Hatta, Shinji; and Abe, Masashi, 5,003,991, Cl. 128-784.000.

Abe, Yuji: *See—*
Kano, Atsushi; Mizuno, Masayuki; Kajiwara, Manabu; Sakaue, Kenji; Abe, Yuji; and Nakamura, Kazuo, 5,004,217, Cl. 271-10.000.

Abkowitz, Martin A.: *See—*
Badesha, Santokh S.; Stolka, Milan; Pai, Damodar M.; and Abkowitz, Martin A., 5,004,663, Cl. 430-59.000.

Acer Incorporated: *See—*
Lee, Sheau-Jiung, 5,004,938, Cl. 307-448.000.

ACF Industries, Inc.: *See—*
Schmidt, Kenneth D.; and Holt, Jan D., 5,004,386, Cl. 410-62.000.

Achiever Industries, Ltd.: *See—*
Chan, Yet, 5,005,034, Cl. 354-204.000.

Ackerman, John R.: *See—*
Stirling, Thomas E.; and Ackerman, John R., 5,004,484, Cl. 55-53.000.

Ackermann, Wilhelm; Langlitz, Karlheinz; and Schmitz, Gunter, to Mannesmann Aktiengesellschaft. Torque support for drives riding on trunnions, particularly for converter tilt drives. 5,003,835, Cl. 74-411.000.

Actronic Lighting CC: *See—*
Cockram, David J.; and Cockram, Edgar S. R., 5,004,960, Cl. 315-307.000.

Adachi, Keiichi; Katoh, Kazunobu; and Kawamura, Kouichi, to Fuji Photo Film Co., Ltd. Silver halide photosensitive material. 5,004,674, Cl. 430-333.000.

Adams, Ann H.: *See—*
Merickel, Michael B.; Adams, Ann H.; and Brookeman, James R., 5,003,979, Cl. 128-653.00A.

Adams, Frank H.: *See—*
Schmidt, Robert J.; Haizmann, Robert S.; Ford, Mark R.; Low, C. David; and Adams, Frank H., 5,004,859, Cl. 585-741.000.

Adams, James; Gobel, Richard; and Lanham, Bryan, to Beloit Corporation. Shear hub. 5,004,028, Cl. 144-176.000.

Adany, Shalom; and Levi, Amram. Multi-annual calendar. 5,003,713, Cl. 40-113.000.

Adolph Coors Company: *See—*
Shriver, Frank L., 5,003,875, Cl. 101-350.000.

Advance Security Inc.: *See—*
Chen, Michael, 5,004,931, Cl. 307-10.200.

Advanced Cardiovascular Systems, Inc.: *See—*
Taylor, Charles S.; and Hampton, Hilary J., 5,003,989, Cl. 128-772.000.

Advanced Micro Devices, Inc.: *See—*
Bohrer, Mark W., 5,004,986, Cl. 330-257.000.
Radjy, Nader A.; and Briner, Michael S., 5,005,155, Cl. 365-185.000.

Aerotech, Inc.: *See—*
Hans, Paul C.; and Rosenfield, Gary C., 5,004,186, Cl. 244-3.250.

Agency of Industrial Science and Technology: *See—*
Suzuki, Susumu; Ishida, Kazuyuki; and Ozaki, Takeo, 5,003,977, Cl. 128-633.000.

Agfa-Gevaert Aktiengesellschaft: *See—*
Meckl, Heinz; Klotzer, Sieghart; Wolff, Erich; and Haseler, Helmut, 5,004,676, Cl. 430-398.000.

Agfa-Gevaert, N.V.: *See—*
Vermeulen, Leon L.; Pauwels, Robert S.; De Smedt, Willy P.; and Vervloet, Ludovicus H., 5,004,659, Cl. 430-14.000.

Aghajanian, Michael K.: *See—*
Park, Eugene S.; and Aghajanian, Michael K., 5,004,034, Cl. 164-97.000.

Agracetus: *See—*
Umbeck, Paul F., 5,004,863, Cl. 800-205.000.

Agranat, Edward A.: *See—*
Kleven, Lawrence P.; Agranat, Edward A.; Crisafulli, Jerry; Robinson, Hugh; Smith, David J.; Wiseley, Thomas; Fortier, Richard C.; Johnson, Severne; and Menzin, Marvin, 5,004,954, Cl. 315-106.000.

Ahn, Chang S., to Goldstar Co., Ltd. Carriage device for an electronic typewriter using a two-row daisy wheel. 5,004,360, Cl. 400-144.200.

Aiello, Richard E.; Stillie, Donald G.; and Allgood, Christopher L., to AMP Incorporated. Printed circuit board edge connector. 5,004,434, Cl. 439-636.000.

Aisaka, Tatsuryoshi: *See—*
Shimamura, Keizo; Amano, Kagetaka; Aisaka, Tatsuryoshi; Hanai, Satoshi; and Nagata, Kohsoku, 5,004,498, Cl. 75-233.000.

Aisin AW Co., Ltd.: *See—*
Sakakibara, Shiro; and Furuya, Takashi, 5,004,082, Cl. 192-3.260.

Aisin AW Kabushiki Kaisha: *See—*
Suzuki, Akira, 5,004,440, Cl. 137-625.650.

Aisin Seiki Kabushiki Kaisha: *See—*
Takeda, Toshio, 5,003,957, Cl. 123-564.000.

Aisin Takaoka Co., Ltd.: *See—*
Oono, Toshio; and Uemura, Hiroki, 5,004,078, Cl. 188-218.00A.

Akagi, Toshimichi: *See—*
Shibata, Masanori; Okimoto, Haruo; Akagi, Toshimichi; and Tashima, Seiji, 5,003,781, Cl. 60-600.000.

Akao, Yasushi: *See—*
Nakada, Kunihiko; and Akao, Yasushi, 5,005,121, Cl. 364-200.000.

Akashi, Akira; Kadohara, Terutake; Ohnuki, Ichiro; and Higashihara, Masaki, to Canon Kabushiki Kaisha. Auto focus adjusting device. 5,005,037, Cl. 354-400.000.

Akishima Chemical Industries Co., Ltd.: *See—*
Tadenuma, Masahiko; Miyagi, Tetsuhiro; and Miyazawa, Tadashi, 5,004,776, Cl. 524-377.000.

Aktiebolaget SKF: *See—*
Berg, Sven-Olof; Broden, Ingemar; and Johansen, Odvar, 5,004,395, Cl. 414-412.000.

Al-Yazdi, Ahmed M. Apparatus and method for separating water from crude oil. 5,004,552, Cl. 210-789.000.

Albert-Frankenthal AG: *See—*
Prum, Sebastian, 5,004,451, Cl. 493-359.000.

Albrecht, Karoly: *See—*
Jekkel nee Bokany, Antonia; Albrecht, Karoly; Ambrus, Gabor; Lang, Tibor; Szabo, Istvan M.; Ilkoy, Eva; Konczol, Kalman; Moravcsik, Imre; Hantos, Gabor; Simonovits, Emilia; Lengyel nee Szemenyei, Zsuzsanna; Vida, Zsuzesanna; and Csajagi, Eva, 5,004,695, Cl. 435-253.100.

Alcan International Limited: *See—*
Hunter, John A.; Scamans, Geoffrey M.; O'Callaghan, Wilfred B.; and Wycliffe, Paul A., 5,004,654, Cl. 429-50.000.
Lyons, Nicholas; Baxter, William R. S.; Woodward, Adrian M.; and Clarke, Roger W., 5,004,542, Cl. 210-356.000.

Alfa Costruzioni Meccaniche S.p.A.: *See—*
Orlandi, Ireneo, 5,004,517, Cl. 156-567.000.

Alinovi, Mario B., to Omar S.n.c. di Mario Baiocchi Alinovi & C. Automatic skinner for non-scaly fish. 5,003,667, Cl. 452-125.000.

Alkermes: *See—*
Pardridge, William M., 5,004,697, Cl. 436-547.000.

Allen-Bradley Company: *See—*
Knutsen, Neil W., 5,005,152, Cl. 364-900.000.

Allen-Bradley International Limited: *See—*
Atkinson, Anthony; Gray, Richard; and Denes, Oscar L., 5,003,693, Cl. 29-849.000.

Allen, Floyd L.; Best, Glen H.; and Lindroth, Thomas A., to Merck & Co., Inc. Welan gum in cement compositions. 5,004,506, Cl. 106-729.000.

Allen, Jimmy D.: *See—*
Hillman, Robert S.; Cobb, Michael E.; Allen, Jimmy D.; Gibbons, Ian; Ostoich, Vladimir E.; and Winfrey, Laura J., 5,004,923, Cl. 250-341.000.

Allet, Bernard: *See—*
Fiers, Walter C.; and Allet, Bernard, 5,004,689, Cl. 435-69.510.

Alley, Russell I.; and Caine, George E., to CAC, Inc. Magnesium oxychloride cement compositions and methods for manufacture and use. 5,004,505, Cl. 106-685.000.

Allflex Europe S.A.: *See—*
Biggio, Alain; and Landrevie, Jacques, 5,004,897, Cl. 235-441.000.

Allgood, Christopher L.: *See—*
Aiello, Richard E.; Stillie, Donald G.; and Allgood, Christopher L., 5,004,434, Cl. 439-636.000.

Allied-Signal Inc.: *See—*
Arnett, Eric M., 5,004,910, Cl. 250-226.000.
Das, Sajal; and Prevorsek, Dusan C., 5,004,788, Cl. 525-504.000.
Harnish, Daniel F.; Pickens, Donald; and Zweig, Andrew M., 5,004,790, Cl. 526-242.000.
Olson, Larry D.; and Kamla, Jeffrey R., 5,004,775, Cl. 524-371.000.

Stranford, Gerald T.; Gonczy, Stephen T.; and Mitsche, Roy T., 5,004,709, Cl. 501-97.000.

Allport, Davies, to T-Systems Corp. Method for protecting drip irrigation hoses and other structures from root intrusion. 5,003,726, Cl. 47-48.500.

Alm, Terry J.: *See*—
Wagner, Oryn B.; and Alm, Terry J., 5,004,398, Cl. 414-723.000.

Alonso, Nelson. Bidet assembly with drainage. 5,003,645, Cl. 4-448.000.

Alperk Limited: *See*—
Higgins, John; and McDonagh, Michael, 5,003,868, Cl. 99-357.000.

Alpha Industries, Inc.: *See*—
Borzym, John J.; and Borzym, Alexander, 5,003,853, Cl. 83-318.000.

Alpine Electronics Inc.: *See*—
Kikuchi, Takashi; and Aoyagi, Shigeo, 5,005,090, Cl. 360-92.000.

Alps Electric Co., Ltd.: *See*—
Fuse, Masashi, 5,005,029, Cl. 346-107.00R.
Ishikawa, Hiroshi; Hasegawa, Kazuo; and Gotoh, Masaki, 5,004,898, Cl. 235-475.000.
Komatsu, Norimasa; and Miyazaki, Asashi, 5,005,094, Cl. 360-105.000.
Koutaka, Yoshirou, 5,004,880, Cl. 200-521.000.
Onodera, Norio, 5,005,105, Cl. 361-398.000.
Shigenai, Osamu; and Sato, Keiichi, 5,005,092, Cl. 360-99.060.

Alread, Don. Exercise glove. 5,004,231, Cl. 272-143.000.

Alt, Eckhard. Cardiac and pulmonary physiological analysis via intracardiac measurements with a single sensor. 5,003,976, Cl. 128-419.0PG.

Altendorf, John M.; and Wong, Marvin G., to Hewlett-Packard Company. Soldering interconnect method and apparatus for semiconductor packages. 5,005,070, Cl. 357-74.000.

Altschuler, Martin D.; and Whittington, Richard, to University of Pennsylvania. Interactive statistical system and method for predicting expert decisions. 5,005,143, Cl. 364-554.000.

Aluminum Company of America: *See*—
Morton, Philip G., 5,003,747, Cl. 52-656.000.

ALZA Corporation: *See*—
Osborne, James L.; Nelson, Melinda; Enscore, David J.; Yum, Su I.; and Gale, Robert M., 5,004,610, Cl. 424-448.000.

Amada Company, Limited: *See*—
Lim, Gnian C., 5,004,890, Cl. 219-121.830.

Amana Refrigeration Inc.: *See*—
Montuoro, Lou D.; Vandarakis, Toni L.; and Johnson, Richard L., 5,004,305, Cl. 312-214.000.

Amano, Haruo, to NEC Corporation. Semiconductor device. 5,005,071, Cl. 357-85.000.

Amano, Kagetaka: *See*—
Shimamura, Keizo; Amano, Kagetaka; Aisaka, Tatsuryoshi; Hanai, Satoshi; and Nagata, Kohsoku, 5,004,498, Cl. 75-233.000.

Amano, Tetsuya; Mita, Seiichi; Izumita, Morishi; Doi, Nobukazu; Kaneko, Mamoru; Yamauchi, Hiroto; and Kasai, Susumu, to Hitachi, Ltd.; Hitachi Denshi Kabushiki Kaisha; and Hitachi Video Engineering, Inc. Method and apparatus for waveform equalization. 5,005,184, Cl. 375-14.000.

Ambrus, Gabor: *See*—
Jekkel nee Bokany, Antonia; Albrecht, Karoly; Ambrus, Gabor; Lang, Tibor; Szabo, Istvan M.; Ilkoy, Eva; Konczol, Kalman; Moravcsik, Imre; Hantos, Gabor; Simonovits, Emilia; Lengyel nee Szemenyei, Zsuzsanna; Vida, Zsuzesanna; and Csajagi, Eva, 5,004,695, Cl. 435-253.100.

American Bank Note Holographics, Inc.: *See*—
D'Amato, Salvatore F.; Sorbo, Peter; and Dunning, Richard E., 5,003,915, Cl. 118-46.000.

American Electric FL Industries, Inc., Division: *See*—
Suk, Eugene J., 5,004,199, Cl. 248-231.800.

American Tourister, Inc.: *See*—
Natho, Bradford J.; Andrade, George L.; Wheaton, John M.; and Schmitt, Wayne I., 5,004,091, Cl. 190-18.00R.

Ames, Matthew M.; and Kovach, John S., to Mayo Foundation for Medical Education and Research. Hexamethylmelamine formulation exhibiting reduced neurotoxicity. 5,004,593, Cl. 424-10.000.

Amikura, Kazuo: *See*—
Ohzeki, Yoshiyuki; and Amikura, Kazuo, 5,004,941, Cl. 310-49.00R.

Amoco Corporation: *See*—
Hansen, John S.; and Waranius, William A., 5,004,860, Cl. 585-812.000.
Park, Chang M.; and Schammel, Wayne P., 5,004,830, Cl. 562-413.000.

AMP Incorporated: *See*—
Aiello, Richard E.; Stillie, Donald G.; and Allgood, Christopher L., 5,004,434, Cl. 439-636.000.
Aoyama, Koji, 5,004,436, Cl. 439-752.000.
DelGuidice, Henry L.; and Marsh, Edward K., 5,004,430, Cl. 439-350.000.
Koblitz, Francis F.; O'Shea, Thomas M.; Stoner, Beverly A.; and Yula, Joseph J., 5,004,869, Cl. 174-84.00C.
McKee, Michael J.; Miknis, William D.; Pawlikowski, Joseph M.; and Zelko, William E., 5,004,887, Cl. 219-85.160.
Yagawa, Hiroshi, 5,003,846, Cl. 81-9.420.

Amrhein, Reinhard; Heid, Walter; and Muschong, Gunther, to Mannesmann Rexroth GmbH. Directional control device. 5,004,015, Cl. 137-625.680.

Anderson, Adrian J.: *See*—
Carey, Michael J.; and Anderson, Adrian J., 5,005,183, Cl. 375-1.000.

Anderson, Alexander A. Light for toilet bowl. 5,003,648, Cl. 4-661.000.

Anderson, Michael P., to Exxon Research and Engineering Company. Method for the chemical preparation of zirconia alloy powders and article. 5,004,710, Cl. 501-103.000.

Anderson, Olin S., Jr.: *See*—
Peabody, Alan M.; Anderson, Olin S., Jr.; and Morton, Henry H., 5,004,459, Cl. 604-29.000.

Anderson, Ray C. Finning and thread rolling machine. 5,003,690, Cl. 29-727.000.

Anderson, Scott. Vehicle seat mounting structure. 5,004,206, Cl. 248-585.000.

Andrade, George L.: *See*—
Natho, Bradford J.; Andrade, George L.; Wheaton, John M.; and Schmitt, Wayne I., 5,004,091, Cl. 190-18.00R.

Andrasko, Stephen W.: *See*—
Parsons, Gerald J.; Greenwald, Brian D.; McGrath, John J.; and Andrasko, Stephen W., 5,005,197, Cl. 379-21.000.

Andresen, Bernhard H., to Texas Instruments Incorporated. Non-loading output driver circuit. 5,004,936, Cl. 307-443.000.

Andruet, Jean-Claude. Electrically powered motor vehicle. 5,004,061, Cl. 180-65.500.

Angeles Nursery Toys, Inc.: *See*—
Kelly, Ray G., 5,003,649, Cl. 5-8.000.

Anno, Masahiro: *See*—
Ohtani, Junji; Anno, Masahiro; Sano, Eiichi; Machida, Junji; and Masuda, Fumio, 5,004,665, Cl. 430-106.600.

Antel, William E., to Antelco Pty. Ltd. Adjustable miniature watering device. 5,004,161, Cl. 239-542.000.

Antelco Pty. Ltd.: *See*—
Antel, William E., 5,004,161, Cl. 239-542.000.

Antezana, Luis F. Gyrating drive for particle screening machine. 5,003,833, Cl. 74-87.000.

Anthony, Brian J.: *See*—
Grzybowski, Kenneth F.; and Anthony, Brian J., 5,004,772, Cl. 524-62.000.

Anthony, Shane L. Protective cover for automotive tape player. 5,004,634, Cl. 428-31.000.

Antoine, Michel; Barreau, Michel; Desconclois, Jean-Francois; Girard, Philippe; and Picaut, Guy, to Laboratoire Roger Bellon. Benzo[1,8-]naphthyridine derivatives, their preparation and the compositions which contain them. 5,004,745, Cl. 514-254.000.

Antonious, Anthony J. Putter with L-shaped hosel. 5,004,237, Cl. 273-80.200.

Antonious, Anthony J. Metal wood type golf club head with integral upper internal weighted mass. 5,004,241, Cl. 273-167.00H.

Ao, Kenichi: *See*—
Yoshino, Yoshimi; Ao, Kenichi; Izawa, Ichiro; and Arasuna, Toshikazu, 5,005,064, Cl. 357-27.000.

Aoki, Hitoshi: *See*—
Misaki, Takashi; and Aoki, Hitoshi, 5,005,010, Cl. 340-705.000.

Aono, Yoshihito; Iwamatsu, Takanori; Minowa, Morihiko; Takenaka, Sadao; Daidoh, Yoshimasa; Nakamura, Hiroshi; and Fujino, Nobutsugu, to Fujitsu Limited. Digital demodulator apparatus. 5,005,186, Cl. 375-82.000.

Aoyagi, Shigeo: *See*—
Kikuchi, Takashi; and Aoyagi, Shigeo, 5,005,090, Cl. 360-92.000.

Aoyama, Keisuke: *See*—
Suda, Yasuo; Ohtaka, Keiji; Suzuki, Kenji; Ishizaki, Akira; and Aoyama, Keisuke, 5,005,041, Cl. 354-407.000.

Aoyama, Koji, to AMP Incorporated. Electrical connector. 5,004,436, Cl. 439-752.000.

AP Parts Manufacturing Company: *See*—
Van Blaircum, Bennie A.; Harwood, Jon W.; and Kimmet, Mark S., 5,004,069, Cl. 181-282.000.

Apfel, Helmut. Control arrangement for the chromatography of liquid. 5,004,538, Cl. 210-198.200.

Apple Computer, Inc.: *See*—
Perlman, Stephen G.; Okun, Jerome M.; Palevich, John H.; and Lundblad, James A., 5,005,011, Cl. 340-728.000.

Appleton, Arthur I. Horseshoe. 5,004,052, Cl. 168-4.000.

Aqua Pura Group: *See*—
Tacchi, Ernest J., 5,004,587, Cl. 422-186.190.

Aquatec Water Systems Incorporated: *See*—
Bosko, Robert S.; and Barnes, Thomas C., 5,004,535, Cl. 210-90.000.

Arahara, Kozo; Fukui, Tetsuro; Fukumoto, Hiroshi; Katayama, Masato; and Takasu, Yoshio, to Canon Kabushiki Kaisha. Photosensitive material, and image formation process and image formation apparatus using same. 5,004,667, Cl. 430-255.000.

Arai, Fuminori; and Kondo, Asaji, to Fuji Photo Film Co., Ltd. Dry-type multilayer analytical element. 5,004,685, Cl. 435-25.000.

Arai, Tatsuo; and Haga, Katsumi, to Mitsubishi Metal Corporation. Clamped cutting tool. 5,004,378, Cl. 407-106.000.

Arai, Yasunori: *See*—
Inoue, Yoshihisa; and Arai, Yasunori, 5,005,093, Cl. 360-99.060.

Aramaki, Minoru; Suenaga, Takashi; Sakaguchi, Hiroaki; and Hamana, Takanori, to Central Glass Company, Limited. Method of preparing trifluoromethanesulfonic acid anhydride. 5,004,829, Cl. 562-113.000.

Arasuna, Toshikazu: *See*—
Yoshino, Yoshimi; Ao, Kenichi; Izawa, Ichiro; and Arasuna, Toshikazu, 5,005,064, Cl. 357-27.000.

Archer Daniels Midland Company: *See*—
Binder, Thomas P.; and Logan, Robert M., 5,004,507, Cl. 127-58.000.

Arco Chemical Technology, Inc.: *See—*
Schon, Steven G.; and Hazbun, Edward A., 5,004,479, Cl. 44-302.000.

Arelli, Pier L.: *See—*
Sommi, Franco; and Arelli, Pier L., 5,004,621, Cl. 426-386.000.

Aristech Chemical Corporation: *See—*
Pugach, Joseph; and Salek, Jeffrey S., 5,004,839, Cl. 568-390.000.

Aritomi, Mitsutoshi: *See—*
Terauchi, Makoto; Ikeda, Chikako; and Aritomi, Mitsutoshi, 5,004,800, Cl. 528-351.000.

Arnett, Eric M., to Allied-Signal Inc. Method of decoding encoded relative spectral data. 5,004,910, Cl. 250-226.000.

Arrow International Investment Corporation: *See—*
Botterbusch, Carl N.; and Frankhouser, Paul L., 5,004,456, Cl. 604-53.000.

Arrow Marine, Inc.: *See—*
Fonss, Jack G.; Silverberg, Howard Z.; and Gardiner, Martin H., 5,004,962, Cl. 318-85.000.

Arsenault, Normand P.: *See—*
Hay, Robert A.; Willkens, Craig A.; and Arsenault, Normand P., 5,004,544, Cl. 210-490.000.

Arterbury, Bryant A., to Otis Engineering Corporation. Low profile dual screen prepack. 5,004,049, Cl. 166-228.000.

Arthurs, Edward; Goodman, Matthew S.; Kim, Chong K.; and Lee, Tony T., to Bell Communications Research, Inc. Multicast packet switching method. 5,005,167, Cl. 370-4.000.

Arva AG: *See—*
Vaterlaus, Arthur, 5,004,130, Cl. 222-590.000.

Asahi Glass Company, Ltd.: *See—*
Ogawa, Masanobu; and Shibata, Shinya, 5,005,020, Cl. 343-713.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Hane, Toshioki; and Katayama, Shigeki, 5,004,648, Cl. 428-364.000.

Asahi Kogaku Kabushiki Kaisha: *See—*
Suzuki, Noboru; Toji, Shigeo; and Uenaka, Yukio, 5,005,087, Cl. 358-227.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Sato, Osamu; and Hirai, Isamu, 5,005,042, Cl. 354-412.000.

Asano, Mitsuyasu, to Sony Corporation. Method and apparatus for reducing noise in a video signal. 5,005,081, Cl. 358-167.000.

Ascenzo, Anthony. Lifting device for objects. 5,004,075, Cl. 187-8.410.

Ashizawa, Masaaki; Nishimoto, Kazuo; Oomura, Atsushi; and Ito, Shuji, to Nichias Corporation. Rubber-coated gasket material. 5,004,650, Cl. 428-463.000.

Ashland Oil, Inc.: *See—*
Clinkenbeard, Jack L., 5,004,696, Cl. 436-51.000.

Ashok, Sawant: *See—*
Lee, Sunggyu; Ashok, Sawant; and Kulik, Conrad J., 5,004,717, Cl. 502-50.000.

Ashton, Michael J.; Bridge, Andrew W.; Chambers, Robert K.; Dron, Donald I.; Fenton, Garry; Harris, Neil V.; Lythgoe, David J.; McFarlane, Ian M.; Newton, Christopher G.; Riddell, David; Smith, Christopher; Stuttle, Keith A. J.; and Toft, Malcolm P., to May & Baker Limited. Isoquinolinones. 5,004,747, Cl. 514-309.000.

Ashworth Bros., Inc.: *See—*
Roinestad, Gerald C.; and Straight, Michael R., 5,004,097, Cl. 198-803.010.

Astra Meditec Aktiebolag: *See—*
Soderberg, Per O., 5,004,420, Cl. 433-172.000.

AT&T Bell Laboratories: *See—*
Daoud, Bassel H., 5,004,433, Cl. 439-502.000.
Desurvire, Emmanuel; Giles, Clinton R.; Simpson, Jay R.; and Zyskind, John L., 5,005,175, Cl. 372-6.000.
Feldman, Martin; and Simpson, Princess E., 5,004,321, Cl. 350-320.000.
Glass, Alastair M.; Knox, Wayne H.; and Nolte, David D., 5,004,325, Cl. 350-354.000.
Modisette, David R., Jr.; and Nelson, Donald R., 5,005,171, Cl. 370-110.100.
Nelson, Donald R., 5,005,170, Cl. 370-84.000.
Wood, Thomas H., 5,005,212, Cl. 455-606.000.

Atari Games Corporation: *See—*
Behensky, Max L.; Moncrief, Rick L.; Margolin, Jed; and Mott, Stephanie J., 5,005,148, Cl. 364-578.000.

Atkins, Kenneth E.; Gentry, Robert R.; and Gandy, Raymond C., to Union Carbide Chemicals & Plastics Technology Corporation. Low profile molding system. 5,004,765, Cl. 523-434.000.

Atkinson, Anthony; Gray, Richard; and Denes, Oscar L., to Allen-Bradley International Limited. Manufacture of electrical circuits. 5,003,693, Cl. 29-849.000.

Atkinson, Robert W., to Zimmer. Skin graft preparation apparatus. 5,004,468, Cl. 606-132.000.

Atochem: *See—*
Millet, Jean-Christophe; and Jaccaud, Michel, 5,004,527, Cl. 204-82.000.

Attardi, Anthony A.: *See—*
Stokes, Ronald E.; Nowak, William J.; Attardi, Anthony A.; and Costanza, Daniel W., 5,005,054, Cl. 355-273.000.

Aubry, Jacques A.; and Mondet, Jean J., to Societe Nationale Industrielle et Aerospatiale. Resilient return strut of the elastic-hydraulic type with incorporated linear damping by throttling a high-viscosity fluid. 5,004,215, Cl. 267-140.100.

Auerbach, Andrew B.: *See—*
Broussard, Jerry A.; Auerbach, Andrew B.; Yang, Nan L.; Paul, James L.; Zheng, Yong C.; and Zhang, Chong L., 5,004,798, Cl. 528-230.000.

Augerscope, Inc.: *See—*
Irwin, Lawrence F., 5,004,119, Cl. 220-247.000.

Aune, Jan A.; and Pedersen, Thor, to Elkem a/s. Method and apparatus for treatment of dust recovered from off gases in metallurgical processes. 5,004,496, Cl. 75-10.280.

Auric-Chlor, Inc.: *See—*
Dunn, Wendell E., Jr.; Carda, Dan D.; and Storbeck, Timothy A., 5,004,500, Cl. 75-422.000.

Auriol, Jean-Louis: *See—*
Maurice, Jacques; Fouque, Romain; and Auriol, Jean-Louis, 5,004,591, Cl. 423-578.00R.

Automotive Products plc: *See—*
Bolton, John S., 5,004,088, Cl. 192-106.200.

Avco Corporation: *See—*
Horgan, John J.; and Ociepka, Val S., 5,004,044, Cl. 165-145.000.

Ayers, Robert C.; and Lee, Ted, to Rx Rocker Corporation. Rocking wheelchair. 5,004,259, Cl. 280-304.100.

Azer, Samir N.; Salman, Naser N.; and Krause, William R., to Orthopedic Designs, Inc. Fracture alignment device. 5,003,969, Cl. 128-87.00R.

Azuma, Yuichi: *See—*
Shibata, Katsuhiro; Azuma, Yuichi; and Suzuki, Tsuguya, 5,004,497, Cl. 75-229.000.

B. F. Goodrich Company, The: *See—*
Lochhead, Robert Y.; Castaneda, Janet Y.; and Hemker, Wilfred J., 5,004,598, Cl. 424-59.000.
Nagarajan, Madukkarai K.; Wherley, Fred J.; and Frimel, Jody W., 5,004,557, Cl. 252-174.240.

Baader, Ekkehard; Bickel, Martin; Brocks, Dietrich; Gunzler, Volkmar; Henke, Stephan; and Hanauske-Abel, Hartmut, to Hoechst Aktiengesellschaft. Substituted pyridine-2,4-dicarboxylic acid derivatives and medicaments based on these compounds. 5,004,748, Cl. 514-350.000.

Baas, Kevin R., to Price Brothers Company. Snap ring joint assembly. 5,004,274, Cl. 285-288.000.

Baba, Hideo: *See—*
Hara, Yasuhiro; Inoue, Mitsuhiro; Baba, Hideo; Okazaki, Tadashi; and Kudo, Shigeru, 5,004,089, Cl. 192-107.00M.

Baba, Yasuyuki: *See—*
Nakatani, Seiichi; Yuhaku, Satoru; Nishimura, Tsutomu; Terada, Yukio; and Baba, Yasuyuki, 5,004,640, Cl. 428-195.000.

Babcock-Hitachi Kabushiki Kaisha: *See—*
Ishida, Nobuyoshi; Michimoto, Takashi; Miyake, Katsutaro; and Ichige, Toshio, 5,004,718, Cl. 502-217.000.

Bachmann, Othmar: *See—*
Waeber, Rene; Demuth, Robert; Knabenhans, Fritz; and Bachmann, Othmar, 5,003,670, Cl. 19-66.0CC.

Badesha, Santokh S.; Stolka, Milan; Pai, Damodar M.; and Abkowitz, Martin A., to Xerox Corporation. Photoconductive imaging members with polyphosphazene binders. 5,004,663, Cl. 430-59.000.

Badiali, Roberto: *See—*
Colli, Luigi; Badiali, Roberto; and Marangone, Nereo, 5,004,171, Cl. 242-35.60R.

Bagley, William C.: *See—*
Langford, Stephen R.; Stone, James R.; and Bagley, William C., 5,004,058, Cl. 177-25.130.

Bailey, F. Courtney: *See—*
Law, Kock-Yee; and Bailey, F. Courtney, 5,004,661, Cl. 430-59.000.

Bainbridge, David W., to Manville Corporation. Insulated exhaust pipe and manufacture thereof. 5,004,018, Cl. 138-149.000.

Baker, Charles L.; Cody, George D.; Joseph, Craig A.; and Sela, Uri, to Exxon Research & Engineering Company. Acoustic monitoring of two phase feed nozzles. 5,004,152, Cl. 239-8.000.

Bakker, Jacobus G. C.; and Collet, Marnix G., to U.S. Philips Corporation. Image sensor device of the frame transfer type. 5,005,062, Cl. 357-24.000.

Balazs, Laszlo : *See—*
Kinczel, Peter; Balazs, Laszlo ; and Sajo, Gabor, 5,004,948, Cl. 313-486.000.

Ball, David D.: *See—*
Loch, Eugene W.; Ball, David D.; and Mack, George F., 5,004,129, Cl. 220-366.000.

Balliew, Robert E.: *See—*
Morris, Carroll E., Jr.; Balliew, Robert E.; Mathieu, Mark A.; and Johnsrud, Darrell B., 5,004,978, Cl. 324-158.00R.

Barbagli, Rino O.; and De Castelli, Giorgio, to Fiatgeotech S.p.A. Tracked vehicle with an epicyclic steering differential. 5,004,060, Cl. 180-6.440.

Barbieri, Silvio: *See—*
Previato, Mario; Barbieri, Silvio; and Martucci, Roberto, 5,004,431, Cl. 439-358.000.

Barder, Timothy J.: *See—*
Barger, Paul T.; Barder, Timothy J.; Lin, David Y.; and Hobbs, Simon H., 5,004,853, Cl. 585-481.000.

Bardhan, Pronob; and Yu, Chyang J., to Corning Incorporated. Frequency stable NPO ceramics. 5,004,713, Cl. 501-134.000.

Barger, Paul T.; Barder, Timothy J.; Lin, David Y.; and Hobbs, Simon H., to UOP. Continuous process for the production of 2,6-dimethylnaphthalene. 5,004,853, Cl. 585-481.000.

Barker, Ray E.: *See—*
Mehrotra, Vikram P.; and Barker, Ray E., 5,004,488, Cl. 65-18.200.

Barmag AG: *See—*
Krenzer, Eberhard, 5,003,677, Cl. 28-220.000.

Barnes, Thomas C.: *See*—
Bosko, Robert S.; and Barnes, Thomas C., 5,004,535, Cl. 210-90.000.

Barnett, Roy, to Teradyne, Inc. Electrically connecting. 5,004,426, Cl. 439-82.000.

Barou, Michel, to SGS-Thomson Microelectronics S.A. Device and a process for detecting current flow in a MOS transistor. 5,004,970, Cl. 323-277.000.

Barreau, Michel: *See*—
Antoine, Michel; Barreau, Michel; Desconclois, Jean-Francois; Girard, Philippe; and Picaut, Guy, 5,004,745, Cl. 514-254.000.

Barrett, Haentjens & Co.: *See*—
Stirling, Thomas E.; and Ackerman, John R., 5,004,484, Cl. 55-53.000.

Barrow, Bennie W. Portable container opener. 5,003,844, Cl. 81-3.200.

Barry, Thomas P. Backpack system for beach related activities. 5,004,134, Cl. 224-209.000.

Bartels, Craig R.: *See*—
Pasternak, Mordechai; Bartels, Craig R.; and Reale, John, Jr., 5,004,861, Cl. 585-818.000.

Bartholomew, Richard M.: *See*—
Frincke, James M.; Bartholomew, Richard M.; and Dillman, Robert O., 5,004,606, Cl. 424-85.800.

Bartky, W. Scott; Paton, Anthony D.; Temple, Stephen; and Michaelis, A. John, to XAAR Limited. Method of manufacturing a droplet deposition apparatus. 5,003,679, Cl. 29-25.350.

Bartley, Harold D.; and Gaiser, William R., to Broadway Companies, Inc. Blown plastic container having an integral single thickness skirt of bi-axially oriented PET. 5,004,109, Cl. 215-1.00C.

BASF: *See*—
Schroeder, Rodney G.; and Sharangpani, Anand S. G., 5,004,504, Cl. 106-456.000.

BASF Aktiengesellschaft: *See*—
Dorow, Joachim; and Bleckmann, Gerhard, 5,003,878, Cl. 101-415.100.
Epple, Gerhard, 5,004,819, Cl. 552-244.000.
Pandl, Klaus; and Patsch, Manfred, 5,004,807, Cl. 534-618.000.
Vogel, Hans-Henning; Rath, Hans P.; Jakob, Claus P.; and Oppenlaender, Knut, 5,004,478, Cl. 44-398.000.

Bassick, John W.; and Dubois, Edward A., to David Clark Company Incorporated. Pressure garment. 5,003,630, Cl. 2-2.10A.

Bastiaansen, Cornelis W. M.: *See*—
Waagen, Geert N.; Bastiaansen, Cornelis W. M.; and Kirschbaum, Robert, 5,004,778, Cl. 524-474.000.

Bastioli, Catia; Garlisi, Salvatore; Fornara, Dario; and Bellotti, Vittorio, to Montefibre, S.p.A. Polyoxyalkylene-ether derivatives having organic acid end-groups, their alkyl ethers and their alkali metal and alkaline-earth metal salts. 5,004,817, Cl. 549-557.000.

Bates, James H. Marker screw cap. 5,003,735, Cl. 52-105.000.

Batiashvili, Boris I.: *See*—
Loladze, Teimuraz N.; Batiashvili, Boris I.; Mamulashvili, Gennady L.; Butskhrikidze, David S.; Grdzelishvili, Georgy J.; and Markevich, Jury I., 5,003,728, Cl. 51-165.800.

Battelle Memorial Institute: *See*—
Carter, John G., 5,004,373, Cl. 405-131.000.
Giddey, Claude; and Dove, Georges, 5,004,623, Cl. 426-564.000.

Baucom, Robert M.: *See*—
Johnston, Norman J.; St. Clair, Terry L.; Baucom, Robert M.; and Gleason, John R., 5,004,575, Cl. 264-136.000.

Bauer, Theodor; and Zweigart, Gerhard, to Daimler-Berg AG. Top framework of a folding top for vehicles. 5,004,291, Cl. 296-116.000.

Baugh, Benton F. Tieback thread with angular freedom. 5,004,273, Cl. 285-27.000.

Baur, Henricus A. C.; and Kragten, Ubaldus F., to Stamicarbon B.V. Process for preparing a cycloalkanone and/or cycloalkanol. 5,004,837, Cl. 568-342.000.

Baxter International Inc.: *See*—
Fronk, David M.; Brookstein, David S.; and Skelton, John, 5,004,474, Cl. 623-13.000.

Baxter, William D.: *See*—
Dull, Raymond P.; Lavas, Bernard R.; and Baxter, William D., 5,003,740, Cl. 52-239.000.

Baxter, William R. S.: *See*—
Lyons, Nicholas; Baxter, William R. S.; Woodward, Adrian M.; and Clarke, Roger W., 5,004,542, Cl. 210-356.000.

Bayer Aktiengesellschaft: *See*—
Blum, Harald; Meixner, Jurgen; Schreckenberg, Manfred; Fleiter, Lothar; and Wellner, Wolfgang, 5,004,779, Cl. 524-591.000.
Kricheldorf, Hans-Rytger; Delius, Ulrich; and Wehrmann, Rolf, 5,004,836, Cl. 568-333.000.
Meier, Helmut-Martin; Kircher, Klaus; and Berg, Klaus, 5,004,569, Cl. 260-410.600.
Weissmuller, Joachim; Tietjen, Klaus-Gunther; Stendel, Wilhelm; and Wachendorff-Neumann, Ulrike, 5,004,744, Cl. 514-247.000.
Zecher, Wilfried; El-Sayed, Aziz; Haese, Wilfried; Kohler, Burkhard; and Meyer, Rolf-Volker, 5,004,795, Cl. 528-73.000.

Bayerische Motoren Werke AG: *See*—
Lemberger, Heinz, 5,003,947, Cl. 123-339.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Kappler, Guenter; and Rist, Dieter, 5,003,768, Cl. 60-39.230.

Bayern-Chemie Geselischaft fuer flugchemische Antriebe mbH: *See*—
Unterforsthuber, Karl; and Koenig, Rudolf, 5,003,887, Cl. 102-531.000.

Bayless, Lee. Collapsible hammock. 5,003,652, Cl. 5-129.000.

Bayview Technology Group, Inc.: *See*—
Schanin, David J., 5,004,969, Cl. 323-235.000.

Bear Automotive Service Equipment Company: *See*—
Marino, Joseph A.; Makhija, Surender K.; Taghikhani, Majid; and Puetz, Peter A., 5,004,979, Cl. 324-160.000.

Beard, William Q., Jr.: *See*—
Hirschmann, Robert P.; Beard, William Q., Jr.; Mainz, Eric L.; Smith, Earl B.; and Little, Barry M., 5,004,849, Cl. 570-224.000.

Beaston, Brook J., to Great Plains Industries, Inc. Dripless coupling device. 5,004,013, Cl. 137-614.050.

Beatty, Scott M.; and Bishop, John R., to Sargent & Greenleaf, Inc. Dial and dial ring assembly with detenting feature. 5,003,802, Cl. 70-333.00A.

Beaumont, Alan R.: *See*—
Booth, Richard C.; Beaumont, Alan R.; Daymond-John, Barbara E.; Cunningham, David G.; and Stallard, William A., 5,004,314, Cl. 350-96.140.

Beaver, Phillip R.; DiGiacinto, Peter M.; Hutchinson, Donald O.; and Vega, Julio J., to Ethyl Corporation. Recovery of hexabromocyclododecane particles. 5,004,847, Cl. 570-186.000.

Beaver, Phillip R., to Ethyl Corporation. Method of elevating the melting point of a hexabromocyclododecane product. 5,004,848, Cl. 570-206.000.

Becker, Kurt J., to Lanxide Technology Company, LP. Method for making metal matrix composites by the use of a negative alloy mold and products produced thereby. 5,004,036, Cl. 164-97.000.

Becker, Richard: *See*—
Braunling, Hermann; and Becker, Richard, 5,004,560, Cl. 526-258.000.

Becker, Thomas P.; Rameshk, Sohrab S.; and Crass, Matthew M., to Snap-on Tools Corporation. Magnetic field pickup assembly for diagnositics on specific engine. 5,004,984, Cl. 324-402.000.

Becker, Wallace E., to Abbott Laboratories. Stabilizing system for solid dosage forms. 5,004,651, Cl. 424-465.000.

Becker, Wilfried: *See*—
Pahnke, Klaus-Dieter; Holl, Rolf; and Becker, Wilfried, 5,003,886, Cl. 102-521.000.

Beckman, John A.; Huang, Shu-Jen; and Ebrat, Abdol R., to Nalco Chemical Company. Method of paint sludge conversion for disposal. 5,004,550, Cl. 210-710.000.

Beckwith, Barry M., to United Technologies Corporation. Bypass conduit for gas turbine engine. 5,003,773, Cl. 60-262.000.

Beckwith, Paul H., to Lumonics Inc. Laser optics quality monitoring. 5,005,177, Cl. 372-34.000.

Becoat, Billie J. Kit for converting a bicycle to a dual wheel driven cycle. 5,004,258, Cl. 280-259.000.

Bedekovic, Davor: *See*—
Phaff, Rox; and Bedekovic, Davor, 5,004,813, Cl. 548-463.000.

Bednar, Fred H.: *See*—
Lipchak, John B.; Oblak, Tod A.; Bednar, Fred H.; Ciaramitaro, William; Hughes, Francis R.; Smith, John R.; and Gisoni, Gregory A., 5,005,142, Cl. 364-550.000.

Behensky, Max L.; Moncrief, Rick L.; Margolin, Jed; and Mott, Stephanie J., to Atari Games Corporation. Driving simulator with moving painted dashboard. 5,005,148, Cl. 364-578.000.

Belkin, Nathan L.: *See*—
Benstock, Gerald M.; Belkin, Nathan L.; and Green, Robert, 5,003,902, Cl. 112-418.000.

Bell, Charles L.: *See*—
Markow, Paul A.; Nolle, William; and Bell, Charles L., 5,004,976, Cl. 324-154.00R.

Bell Communications Research, Inc.: *See*—
Arthurs, Edward; Goodman, Matthew S.; Kim, Chong K.; and Lee, Tony T., 5,005,167, Cl. 370-4.000.

Bell & Howell GmbH: *See*—
Dreschel, Jurgen; Hog, Peter; and Mobs, Stephan, 5,004,220, Cl. 271-184.000.

Bell, Mark E.: *See*—
Moody, G. Lawrence; Leone, David A.; and Bell, Mark E., 5,004,875, Cl. 200-400.000.

Bellin, Howard T.: *See*—
Dingwall, Robert P.; and Bellin, Howard T., 5,003,983, Cl. 128-704.000.

Bellotti, Vittorio: *See*—
Bastioli, Catia; Garlisi, Salvatore; Fornara, Dario; and Bellotti, Vittorio, 5,004,817, Cl. 549-557.000.

Beloit Corporation: *See*—
Adams, James; Gobel, Richard; and Lanham, Bryan, 5,004,028, Cl. 144-176.000.

Bemis, Steve; and Stocker, Erwin E., to Gates Rubber Company, The. Method for forming a fiber composite sealing element. 5,004,513, Cl. 156-191.000.

Bender, Richard C. Automatic fluid flow sensor and fluid shut-off system. 5,004,014, Cl. 137-624.120.

Benham, Harold L.; and Mitchell, James A., to British Petroleum Company p.l.c., The. Process for treating metal surfaces. 5,004,646, Cl. 428-344.000.

Bennett, Mark. Sun-shield. 5,004,285, Cl. 296-1.100.

Benstock, Gerald M.; Belkin, Nathan L.; and Green, Robert, to Superior Surgical Manufacturing Co. Inc. Seam having liquid proof threads stichably securing first and second liquid proof materials foldably enclosing a meltable adhesive polymer film and method of manufacture of same. 5,003,902, Cl. 112-418.000.

Berchowitz, David M., to Sunpower, Inc. Asymmetric gas spring. 5,003,777, Cl. 60-520.000.

Berfield, Robert C., to Shop-Vac Corporation. Attachment system for liquid spray lance. 5,004,160, Cl. 239-525.000.

Berg, Klaus: *See*—
Meier, Helmut-Martin; Kircher, Klaus; and Berg, Klaus, 5,004,569, Cl. 260-410.600.
Berg, Sven-Olof; Broden, Ingemar; and Johansen, Odvar, to Pronova AB; and Aktiebolaget SKF. Apparatus for the emptying of a package band and an arrangement for it. 5,004,395, Cl. 414-412.000.
Berger, Kurt: *See*—
Mutterer, Francis; and Berger, Kurt, 5,004,759, Cl. 524-89.000.
Bergero, Jean-Pierre; and Couasnard, Claude, to Thomson Tubes Electroniques. Microwave load in small-length oversized waveguide form. 5,004,990, Cl. 333-22.00R.
Bergquist, Roger: *See*—
Wislinski, Martin; Bergquist, Roger; Schroeder, Manfred; Weir, Theodore; Monetti, Matthew; and Fung, Paul, 5,004,579, Cl. 264-517.000.
Berkley, Robert D.; and Shaughnessy, Terry P., to Packaging Industries Group, Inc. Flying game bird decoys. 5,003,722, Cl. 43-3.000.
Berkley, Robert D.: *See*—
Lenert, Steven A.; and Berkley, Robert D., 5,003,718, Cl. 43-3.000.
Bernard, Marc, to Thomson-Brandt Armements. System of vehicle guidance by continuous gas jets. 5,004,184, Cl. 244-3.220.
Bernard, Walter; Heppner, Joachim G.; and Schwarz, Karl H., to Bodenseewerk Geratetechnik GmbH. Measuring device having a laser and a ring resonator. 5,004,342, Cl. 356-350.000.
Bernards, Roger F.; Fisher, Gordon; and Sonnenberg, Wade, to Shipley Company Inc. Copper electroplating composition. 5,004,525, Cl. 204-52.100.
Berner, John M.; and Roman, Thomas A., to Truth Incorporated. Window operator control. 5,004,961, Cl. 318-65.000.
Bernhardt, Everett A.; and Winters, Robert C., to Sentrol, Inc. Switch housing with resilient retainers. 5,004,879, Cl. 200-295.000.
Bernstein, Arnold. Disposable debris bag for lawnmowers and sweepers. 5,003,758, Cl. 56-202.000.
Berruex, Serge A. Apparatus for rinsing surfaces with a non-aqueous liquid. 5,004,000, Cl. 134-108.000.
Bertrams, Kurt U. Training aid for such side arms as revolvers and pistols. 5,004,423, Cl. 434-22.000.
Besik, Ferdinand K. Apparatus for ultra high energy efficient heating, cooling and dehumidifying of air. 5,003,961, Cl. 126-110.00R.
Besore, John K.: *See*—
Stocking, George E.; Stich, Richard A.; Besore, John K.; and Denham, Clarence W., 5,004,302, Cl. 312-214.000.
Bessinger, Walter L., to Knape & Vogt Manufacturing Company. Interlock shelving bracket and standard cover. 5,004,201, Cl. 248-243.000.
Bessinger, Walter L.: *See*—
Stumpf, William E.; Carlson, Casey L.; Knape, Richard S.; and Bessinger, Walter L., 5,004,202, Cl. 248-243.000.
Best, Glen H.: *See*—
Allen, Floyd L.; Best, Glen H.; and Lindroth, Thomas A., 5,004,506, Cl. 106-729.000.
Bethlehem Steel Corporation: *See*—
Russo, Thomas J., 5,004,131, Cl. 222-600.000.
Beyar, Mordechay; and Foux, Amnon, to Technion Research and Development Foundation Ltd. Auxiliary intra-urethral magnetic valve for persons suffering from urinary incontinence. 5,004,454, Cl. 600-30.000.
Bhargava, Rameshwar N.: *See*—
Shaulov, Avner A.; Herko, Samuel P.; Dorman, Donald R.; and Bhargava, Rameshwar N., 5,004,726, Cl. 505-1.000.
Bharya, Rajpal S.: *See*—
Dent, Peter R.; and Bharya, Rajpal S., 5,005,150, Cl. 364-736.000.
Bickel, Martin: *See*—
Baader, Ekkehard; Bickel, Martin; Brocks, Dietrich; Gunzler, Volkmar; Henke, Stephan; and Hanauske-Abel, Hartmut, 5,004,748, Cl. 514-350.000.
Bienaime, Patrick, to Unilever Patent Holdings B.Y. Pack made from board. 5,004,147, Cl. 229-198.200.
Bifano, Gabriel F.; and Reyes, Erenio, to Vinyl Corporation. Panel support member and support arrangement. 5,003,743, Cl. 52-282.000.
Biggio, Alain; and Landrevie, Jacques, to Allflex Europe S.A. Automatic connecting device designed for the quick and momentary supply of power to electronic circuits. 5,004,897, Cl. 235-441.000.
Billmers, Robert L., to National Starch and Chemical Investment Holding Corporation. Organosiloxane-containing polysaccharides. 5,004,791, Cl. 527-300.000.
Binder, Thomas P.; and Logan, Robert M., to Archer Daniels Midland Company. Aqueous-alcohol fructose crystallization. 5,004,507, Cl. 127-58.000.
Binks Manufacturing Company: *See*—
Culbertson, Samuel W.; and Williams, Keith G., 5,004,403, Cl. 417-53.000.
Biocyte Corporation: *See*—
Boyse, Edward A.; Broxmeyer, Hal E.; and Douglas, Gordon W., 5,004,681, Cl. 435-2.000.
Biogen, Massachusetts: *See*—
Fiers, Walter C.; and Allet, Bernard, 5,004,689, Cl. 435-69.510.
Biomechanics Corporation of America: *See*—
Gross, Clifford, 5,004,196, Cl. 248-118.300.
Bionix Corporation: *See*—
Glick, J. Leslie, 5,004,615, Cl. 424-692.000.
Biotrack, Inc.: *See*—
Hillman, Robert S.; Cobb, Michael E.; Allen, Jimmy D.; Gibbons, Ian; Ostoich, Vladimir E.; and Winfrey, Laura J., 5,004,923, Cl. 250-341.000.
Bishop, John R.: *See*—
Beatty, Scott M.; and Bishop, John R., 5,003,802, Cl. 70-333.00A.
Bissett, Thomas D.: *See*—
Bruckert, William F.; and Bissett, Thomas D., 5,005,174, Cl. 371-68.300.
Blackstone, Scott C., to Unitrode Corporation. Inverted epitaxial process. 5,004,705, Cl. 437-225.000.
Blaisdell, Leonard L., to GTE Government Systems Corporation. Microwave antenna. 5,005,022, Cl. 343-753.000.
Blaszkiewicz, Peter; and Speck, Ulrich, to Schering Aktiengesellschaft. Substituted dicarboxylic acid-bis(3,5-dicarbamoyl-2,4,6-triiodoanilides), process for their production as well as X-ray contrast media containing them. 5,004,835, Cl. 564-153.000.
Bleckmann, Gerhard: *See*—
Dorow, Joachim; and Bleckmann, Gerhard, 5,003,878, Cl. 101-415.100.
Blezard, Robert C., to Charles Packaging Corporation. Straight line sorting and/or fill-to-weigh machine. 5,004,093, Cl. 198-430.000.
Blontrock, Daniel, to N.V. Verbrugge. Harness frame with detachable corner connections. 5,004,019, Cl. 139-91.000.
Bluhm, Terry L.: *See*—
Fuller, Timothy J.; Marchessault, Robert H.; and Bluhm, Terry L., 5,004,664, Cl. 430-106.600.
Blum, Harald; Meixner, Jurgen; Schreckenberg, Manfred; Fleiter, Lothar; and Wellner, Wolfgang, to Bayer Aktiengesellschaft. Process for the preparation of aqueous, oxidatively drying alkyd resins and their use in or as aqueous lacquers and coating compounds. 5,004,779, Cl. 524-591.000.
Blume, William F.: *See*—
Schumacher, Dean P.; Blume, William F.; and Bonds, John C., 5,004,245, Cl. 273-241.000.
Blumstock, Judith E.; and Morgan, Leslie P., to Protection Protection, Inc. Multi-compartment container. 5,004,106, Cl. 206-581.000.
BMC Software, Inc.: *See*—
Ernst, Theodore R., 5,005,137, Cl. 364-514.000.
Board of Governors of Wayne State University, The: *See*—
Schaap, Arthur P., 5,004,565, Cl. 252-700.000.
Board of Regents, The University of Texas System: *See*—
DeLozanne, A. L., 5,004,721, Cl. 505-1.000.
Boaz, Premakaran T., to Ford Motor Company. Method and apparatus for supporting a sheet of glass. 5,004,284, Cl. 294-118.000.
Bobst, Albert M.; and Pauley, Gary T., to University of Cincinnati. Nitroxide labeled nucleotides and nitroxide labeled hybridization probes. 5,004,809, Cl. 536-29.000.
Bobst SA: *See*—
Stark, Charles, 5,004,221, Cl. 271-194.000.
Bock, Mark G.: *See*—
Evans, Ben E.; Bock, Mark G.; and Freidinger, Roger M., 5,004,741, Cl. 514-221.000.
Bode, Robert E. Apparatus for injecting displacement plugs. 5,004,048, Cl. 166-70.000.
Bodenseewerk Geratetechnik GmbH: *See*—
Bernard, Walter; Heppner, Joachim G.; and Schwarz, Karl H., 5,004,342, Cl. 356-350.000.
Bodine Company, The: *See*—
McDonald, Charles W., 5,004,953, Cl. 315-86.000.
Boehler Ges. m.b.H.: *See*—
Kroisenbrunner, Walter, 5,004,653, Cl. 428-615.000.
Boehm, Jeffrey C.; Hecht, Sidney M.; Holden, Kenneth G.; Johnson, Randall K.; and Kingsbury, William D., to SmithKline Beecham Corporation. Water soluble camptothecin analogs useful for inhibiting the growth of animal tumor cells. 5,004,758, Cl. 514-283.000.
Boeing Company, The: *See*—
Ferrell, Philip J., 5,005,210, Cl. 455-115.000.
Jensen, Tom M.; and Shorey, Thomas H., 5,004,387, Cl. 410-69.000.
Wong, Kin Y.; and Thompson, Douglas, 5,003,826, Cl. 73-828.000.
Bohrer, Mark W., to Advanced Micro Devices, Inc. Op-amp with internally generated bias and precision voltage reference using same. 5,004,986, Cl. 330-257.000.
Boilen, Irving, to Trans-Action Marketing Corp. Changeable watch bezel locking mechanism. 5,005,161, Cl. 368-295.000.
Boinot, Francois; Cousin, Michel; Francois, Pierre-Michel; and Michel-Dansac, Francois, to Societe Chimiques des Charbonnages S.A. Resin compositions based on phenolic resins. 5,004,789, Cl. 525-506.000.
Boiteau, Richard; Labayle, Denis; and Tenaillon, Alain, to Medipro. Device for unblocking intubation tubes and tracheotomy cannulas in vivo. 5,003,657, Cl. 15-104.330.
Bolen, David T.: *See*—
Sodec, Franc; Hudson, Donald L.; and Bolen, David T., 5,003,867, Cl. 98-31.600.
Bolton, John S., to Automotive Products plc. Torsional vibration damper. 5,004,088, Cl. 192-106.200.
Bom, Cornelis J. G.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 5,004,163, Cl. 239-661.000.
Bommer, Jerry C.; and Burnham, Bruce F., to Nippon Petrochemicals Company, Ltd. Tetrapyrrole aminocarboxylic acids. 5,004,811, Cl. 540-145.000.
Bommer, Rainer, to Dragerwerk Aktiengesellschaft. Colorimetric detector tube. 5,004,585, Cl. 422-58.000.
Bonds, John C.: *See*—
Schumacher, Dean P.; Blume, William F.; and Bonds, John C., 5,004,245, Cl. 273-241.000.
Bonnet, Maurice: *See*—
Nerrinck, Bernard; and Bonnet, Maurice, 5,003,711, Cl. 36-120.000.

Booth, Richard C.; Beaumont, Alan R.; Daymond-John, Barbara E.; Cunningham, David G.; and Stallard, William A., to British Telecommunications public limited company. Optical signal modulation device. 5,004,314, Cl. 350-96.140.

Borer, John W.; Skilliter, William J.; and Conner, Lowell J., to Libbey-Owens-Ford Co. Glass sheet conveying and bending apparatus. 5,004,492, Cl. 65-289.000.

Borglum, Brian P., to Raytheon Company. Method of producing optically transparent yttrium oxide. 5,004,712, Cl. 501-126.000.

Born, Dieter; Knauf, Peter; and Reteldorf, Hans-Joachim, to Durum Verschleisschutz GmbH. Method of applying wear-resistant layer and consumable electrode for carrying out the method. 5,004,886, Cl. 219-76.140.

Borom, Marcus P.: *See*—
Svec, Paul S.; Borom, Marcus P.; Szala, Lawrence E.; Brun, Milivoj K.; Miller, Steven A.; and Mourer, David P., 5,004,629, Cl. 427-204.000.

Bortnick, Newman M.: *See*—
Hallden-Abberton, Michael P.; Bortnick, Newman M.; Cohen, Leslie A.; Freed, William T.; and Fromuth, Harry C., 5,004,777, Cl. 524-433.000.

Borzym, Alexander: *See*—
Borzym, John J.; and Borzym, Alexander, 5,003,853, Cl. 83-318.000.

Borzym, John J.; and Borzym, Alexander, to Alpha Industries, Inc. Cut-off die set. 5,003,853, Cl. 83-318.000.

Bosko, Robert S.; and Barnes, Thomas C., to Aquatec Water Systems Incorporated. Water purification system. 5,004,535, Cl. 210-90.000.

Botterbusch, Carl N.; and Frankhouser, Paul L., to Arrow International Investment Corporation. In-dwelling catheter. 5,004,456, Cl. 604-53.000.

Bouchard, Victorin. Foldable dome. 5,004,001, Cl. 135-97.000.

Boucher, Raymond M. G., to Wave Energy Systems, Inc. Virucidal low toxicity compositions. 5,004,757, Cl. 514-694.000.

Boudreau, Robert J., to Hedstrom Corp. Spring connection assembly. 5,004,216, Cl. 267-179.000.

Boulanger, Alain; and Rousseau, Andre J., to Geostock S.A.R.L.; and Esys S.A. Method of rapidly abandoning large cavities washed-out in rock salt. 5,004,298, Cl. 299-5.000.

Bowen, Robert F.; Dudley, Kenneth W.; and Maiellano, Joseph C., Jr., to Raytheon Company. Method of heating food. 5,004,617, Cl. 426-233.000.

Bowlin, Terry L.: *See*—
Liu, Paul S.; Sunkara, Sai P.; and Bowlin, Terry L., 5,004,746, Cl. 514-299.000.

Bowthorpe EMP Limited: *See*—
Doone, Rodney M.; and Colbert, Henry J., 5,003,689, Cl. 29-613.000.

Boyse, Edward A.; Broxmeyer, Hal E.; and Douglas, Gordon W., to Biocyte Corporation. Preservation of fetal and neonatal hematopoietic stem and progenitor cells of the blood. 5,004,681, Cl. 435-2.000.

Braas & Co. GmbH: *See*—
Schulz, Hans E.; Braas, Jurgen; and Echl, Friedrich, 5,004,415, Cl. 425-297.000.

Braas, Jurgen: *See*—
Schulz, Hans E.; Braas, Jurgen; and Echl, Friedrich, 5,004,415, Cl. 425-297.000.

Bradley, Michael W.; Harris, Norman; and Turner, Keith, to Davy McKee (London) Limited. Hydrogenation of aldehydes. 5,004,845, Cl. 568-885.000.

Brandt, Eckhard, to E.C.H. Will GmbH. Apparatus for transporting stacks of paper sheets to processing machines. 5,004,094, Cl. 198-460.000.

Bratrud, Lyle A. Cattle feeding trough. 5,003,926, Cl. 119-62.000.

Bratten, David R. Automatic water shut-off apparatus for building protection. 5,004,012, Cl. 137-560.000.

Braunling, Hermann; and Becker, Richard, to Wacker-Chemie GmbH. Basic polypyrrylenemethines and salts thereof, and a process for their preparation. 5,004,560, Cl. 526-258.000.

Brearley, Malcolm; and Moseley, Richard B., to Lucas Industries public limited company. Electronic braking system. 5,004,299, Cl. 303-15.000.

Brearley, Malcolm; and Moseley, Richard B., to Lucas Industries Public Limited Company. Electronic braking system. 5,004,300, Cl. 303-15.000.

Breen, Michael T.; and Skorupski, Jeffrey H., to Eaton Corporation. Trailer swing control. 5,005,130, Cl. 364-426.010.

Brennen, Kenneth R.: *See*—
Holleman, Timothy W.; Doan, Phong D.; Brennen, Kenneth R.; and Swoyer, John M., 5,003,992, Cl. 128-785.000.

Breslin, Michael K. Pneumatically powered submersible fluids pump with integrated controls. 5,004,405, Cl. 417-131.000.

Bria, Frank: *See*—
Connors, Peter J.; Scully, Sean; Bria, Frank; and ReFalo, John, III, 5,004,103, Cl. 206-372.000.

Bricken, Jonathan, to D.O.C.C., Inc. Process for sterile disposal of syringes. 5,003,892, Cl. 110-346.000.

Bridge, Andrew W.: *See*—
Ashton, Michael J.; Bridge, Andrew W.; Chambers, Robert K.; Dron, Donald I.; Fenton, Garry; Harris, Neil V.; Lythgoe, David J.; McFarlane, Ian M.; Newton, Christopher G.; Riddell, David; Smith, Christopher; Stuttle, Keith A. J.; and Toft, Malcolm P., 5,004,747, Cl. 514-309.000.

Bridgestone Corp.: *See*—
Kadota, Kuninobu; Kohno, Yoshihide; and Koseki, Hiroyuki, 5,004,031, Cl. 152-538.000.

Bridgestone/Firestone, Inc.: *See*—
Griebling, Stephen T., 5,004,635, Cl. 428-33.000.
Koopmann, Gary H., 5,003,819, Cl. 73-146.000.

Briggs, Beatrice E. Painters palette. 5,004,255, Cl. 280-79.500.

Briner, Michael S.: *See*—
Radjy, Nader A.; and Briner, Michael S., 5,005,155, Cl. 365-185.000.

Brinkman, Robert J. Belt type garment with foldable seat cover. 5,003,634, Cl. 2-46.000.

Bristol, Samuel V., to Delco Electronics Corporation. Low residue soldering flux. 5,004,509, Cl. 148-23.000.

British Petroleum Company p.l.c., The: *See*—
Benham, Harold L.; and Mitchell, James A., 5,004,646, Cl. 428-344.000.

British Telecommunications public limited company: *See*—
Booth, Richard C.; Beaumont, Alan R.; Daymond-John, Barbara E.; Cunningham, David G.; and Stallard, William A., 5,004,314, Cl. 350-96.140.

Broadway Companies, Inc.: *See*—
Bartley, Harold D.; and Gaiser, William R., 5,004,109, Cl. 215-1.00C.

Brocks, Dietrich: *See*—
Baader, Ekkehard; Bickel, Martin; Brocks, Dietrich; Gunzler, Volkmar; Henke, Stephan; and Hanauske-Abel, Hartmut, 5,004,748, Cl. 514-350.000.

Brodart Co.: *See*—
Pugliese, Joseph S.; and Garman, Charles L., 5,004,514, Cl. 156-251.000.

Broden, Ingemar: *See*—
Berg, Sven-Olof; Broden, Ingemar; and Johansen, Odvar, 5,004,395, Cl. 414-412.000.

Broderick, James; and Schaul, Malcolm. Buying guide. 5,004,270, Cl. 283-48.100.

Brokaw, Paul E.: *See*—
Nottingham, John R.; Spirk, John W., Jr.; and Brokaw, Paul E., 5,004,882, Cl. 219-10.55E.

Bronder, Joseph B.; and Gossard, William H., to Westinghouse Electric Corp. Frequency division multiplex guardband communication system for sending information over the guardbands. 5,005,169, Cl. 370-76.000.

Brookeman, James R.: *See*—
Merickel, Michael B.; Adams, Ann H.; and Brookeman, James R., 5,003,979, Cl. 128-653.00A.

Brooks, David D.; Brophy, Shirley A.; and Goss, George R., to Oil-Dri Corporation of America. Oil bleaching method and composition for same. 5,004,570, Cl. 260-427.000.

Brookstein, David S.: *See*—
Fronk, David M.; Brookstein, David S.; and Skelton, John, 5,004,474, Cl. 623-13.000.

Brophy, Shirley A.: *See*—
Brooks, David D.; Brophy, Shirley A.; and Goss, George R., 5,004,570, Cl. 260-427.000.

Brossia, Charles E.; and Wu, Samuel C. Fiber optic probe system. 5,005,005, Cl. 340-604.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Ogawa, Masao, 5,003,899, Cl. 112-221.000.
Ogawa, Masao, 5,003,900, Cl. 112-242.000.
Sakaida, Atsuo; Ikezaki, Yoshiyuki; Iriguchi, Akira; and Inose, Toshio, 5,004,946, Cl. 310-328.000.
Yokoe, Masaaki; Kurono, Yoshikazu; and Hayashi, Koji, 5,003,897, Cl. 112-121.120.

Brotz, Gregory R. Electrostatic display device. 5,005,110, Cl. 362-84.000.

Broussard, Jerry A.; Auerbach, Andrew B.; Yang, Nan L.; Paul, James L.; Zheng, Yong C.; and Zhang, Chong L., to Hoechst Celanese Corporation. Novel polyacetal copolymers of trioxane and trimethylolpropane formal derivatives. 5,004,798, Cl. 528-230.000.

Brown, Andrew F.; and Webber, Peter B., to Calcor Space Facility, Inc. Method of fabricating plural shaped parts from a workpiece. 5,004,883, Cl. 219-69.120.

Brown, Donald G.; and Onufrak, Andrew F., to Rockwell International Corporation. High-range and resolution determinate mount and positioner. 5,004,205, Cl. 248-476.000.

Brown, Franklin I., to Ford Motor Company. Method of making glass substrate coated with tin oxide. 5,004,490, Cl. 60-60.520.

Brown, Gordon L., Jr., to Morrison Molded Fiber Glass Company. Apparatus for exercise of the human body. 5,004,226, Cl. 272-93.000.

Brown, James J. Ozone water purification system. 5,004,537, Cl. 210-192.000.

Brown, John C., to JCB Leasing Corp. Brush mower. 5,003,759, Cl. 56-249.000.

Brownrigg, Patrick C.: *See*—
Vali, Victor; Chang, David B.; and Brownrigg, Patrick C., 5,004,914, Cl. 250-227.270.

Broxmeyer, Hal E.: *See*—
Boyse, Edward A.; Broxmeyer, Hal E.; and Douglas, Gordon W., 5,004,681, Cl. 435-2.000.

Bruckert, William F.; and Bissett, Thomas D., to Digital Equipment Corporation. Dual zone, fault tolerant computer system with error checking in I/O writes. 5,005,174, Cl. 371-68.300.

Bruhl, Daniel E., Jr., to Trident Medical Products, Inc. Integrally formed two-piece eyeshield. 5,004,333, Cl. 351-45.000.

Bruinink, Jacob: *See*—
Verhulst, Antonius G. H.; Bruinink, Jacob; and Lenders, Emanuel J. W. M., 5,004,322, Cl. 350-320.000.

Brun, Milivoj K.: *See*—
Svec, Paul S.; Borom, Marcus P.; Szala, Lawrence E.; Brun, Milivoj K.; Miller, Steven A.; and Mourer, David P., 5,004,629, Cl. 427-204.000.
Brunswick Corporation: *See*—
McMorries, Lee W., IV; and Saatkamp, James B., 5,004,042, Cl. 165-41.000.
Bryant Grinder Corporation: *See*—
Halvorsen, James V., 5,003,730, Cl. 51-325.000.
Bublewicz, Leszek, to Phelps-Tointon, Inc. Door lock control system featuring a remote control for a pneumatically powered door lock mechanism. 5,003,800, Cl. 70-264.000.
Buchwald, Stephen L.; and Grossman, Robert B., to Massachusetts Institute of Technology. Preparation of chiral metallocene dihalides. 5,004,820, Cl. 556-53.000.
Buckholz, Lawrence L., Jr.; and Kasper-Lehmann, Robin, to International Flavors & Fragrances Inc. Process for preparing marinaded proteinaceous product and product produced thereby. 5,004,618, Cl. 426-281.000.
Buckley, John T. Expansion system for a medical and surgical dressing. 5,003,971, Cl. 128-156.000.
Buffalini, Jerry E.: *See*—
McGarvey, David C.; and Buffalini, Jerry E., 5,004,632, Cl. 427-410.000.
Bullard, James R.; Muller, Richard P.; Grossi, Benedetto; and Cristine, John, to Bullard, James Roger. Laryngoscope. 5,003,963, Cl. 128-11.000.
Bullard, James Roger: *See*—
Bullard, James R.; Muller, Richard P.; Grossi, Benedetto; and Cristine, John, 5,003,963, Cl. 128-11.000.
Bunce, Kevin R., to Elopak A/S. Valve device for controlling liquid flow. 5,004,009, Cl. 137-512.300.
Bunch, Earnest B., Jr. Continuous form stationery folding machine with perforation alignment apparatus. 5,004,452, Cl. 493-414.000.
Burchette, Herbert L.; Hansen, Lee E.; West, James C.; and Nawrocki, Glen A., to United Technologies Corporation. Axial compressor stator construction. 5,004,402, Cl. 415-137.000.
Burd, Robert C.: *See*—
Fitzpatrick, Mark E.; and Burd, Robert C., 5,004,971, Cl. 323-312.000.
Burdea, Grigore C., to Rutgers University. Portable dextrous force feedback master for robot telemanipulation. 5,004,391, Cl. 414-6.000.
Burdukovsky, Alexandr I.: *See*—
Goikhman, Yakov A.; Krjukov, Georgy M.; Onotsky, Melis I.; Sorokin, Georgy M.; Filatov, Alexei V.; Tsarapkin, Viktor V.; Yakimov, Vadim P.; Smirnov, Gennady A.; Nikiforov, Ivan I.; Burdukovsky, Alexandr I.; Daibov, Sergei V.; and Kurdjukov, Alexandr S., 5,004,056, Cl. 175-293.000.
Burke, John T.; and Newkirk, Marc S., to Lanxide Technology Company, LP. Method of thermo-forming a novel metal matrix composite body and products produced therefrom. 5,004,035, Cl. 164-97.000.
Burnham, Bruce F.: *See*—
Bommer, Jerry C.; and Burnham, Bruce F., 5,004,811, Cl. 540-145.000.
Burnham, William L., to Eastman Kodak Company. Optical finder for camera with flip-up flash unit. 5,005,032, Cl. 354-149.110.
Burr Oak Tool & Gauge Company: *See*—
Milliman, James G.; and Franks, Lawrence A., 5,003,691, Cl. 29-727.000.
Burtin, Jacques: *See*—
Richalley, Gerard; and Burtin, Jacques, 5,004,548, Cl. 210-646.000.
Busby, Philip V. Power operated support or landing legs. 5,004,267, Cl. 280-766.100.
Busenhart, Peter: *See*—
Graf, Felix; and Busenhart, Peter, 5,004,170, Cl. 242-18.00R.
Buteev, Alexandr I.: *See*—
Ulyanitsky, Vladimir J.; Gavrilenko, Tamara P.; Nikolaev, Jury A.; and Buteev, Alexandr I., 5,004,021, Cl. 141-67.000.
Butler Manufacturing Company: *See*—
Penczak, John P., 5,003,737, Cl. 52-126.200.
Butskhrikidze, David S.: *See*—
Loladze, Teimuraz N.; Batiashvili, Boris I.; Mamulashvili, Gennady L.; Butskhrikidze, David S.; Grdzelishvili, Georgy J.; and Markevich, Jury I., 5,003,728, Cl. 51-165.800.
Buzzelli, Vincenzo. Catch basin. 5,004,534, Cl. 210-164.000.
Bylin Heating Systems, Inc.: *See*—
Montierth, Garry L.; Logan, Stephen A.; and Scott, Raymond J., 5,004,190, Cl. 246-428.000.
C. van der Lely N.V.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 5,004,163, Cl. 239-661.000.
Cabourne, Michael K., to Precision Interconnect Corporation. Flexible pin type contact. 5,004,438, Cl. 439-825.000.
CAC, Inc.: *See*—
Alley, Russell I.; and Caine, George E., 5,004,505, Cl. 106-685.000.
Cadwallader, George W.; Highfill, Louis A.; Kurdys, Gregory D.; and Turigliatto, Richard S., to Monsanto Company. Process for preparing sodium tripolyphosphate. 5,004,589, Cl. 423-315.000.
Caine, George E.: *See*—
Alley, Russell I.; and Caine, George E., 5,004,505, Cl. 106-685.000.
Calcor Space Facility, Inc.: *See*—
Brown, Andrew F.; and Webber, Peter B., 5,004,883, Cl. 219-69.120.
Caldwell, J. Michael, to Sili-Tex, Inc. Silicone polymer-internally coated webs. 5,004,643, Cl. 428-246.000.
California Institute of Technology: *See*—
Janesick, James R., 5,005,063, Cl. 357-24.000.
Calvas, George T.: *See*—
Stinar, Robert P.; Calvas, George T.; and McNamara, David A., 5,003,801, Cl. 70-278.000.
Campbell, Andrew B.; and Simon, Ira J., to Triangle Brass Manufacturing Company. Flush bolt mechanism for double doors. 5,004,277, Cl. 292-166.000.
Campbell, Herbert W.: *See*—
Crawford, Paul M.; Campbell, Herbert W.; Myers, Michael J.; and Siverns, Steven L., 5,003,814, Cl. 73-59.000.
Campbell, Jonathan: *See*—
Griffin, David; Campbell, Jonathan; Reilly, Michael; and Rosenbaum, Richard, 5,005,122, Cl. 364-200.000.
Canada, Her Majesty the Queen in Right of, as represented by the Minister of Communications: *See*—
Hill, Kenneth O.; Johnson, Derwyn C.; and Lamont, Robert G., 5,004,316, Cl. 350-96.150.
Candea, Cornell, to Chrysler Corporation. Forming bores in bendable layered materials. 5,003,683, Cl. 29-425.000.
Canon Kabushiki Kaisha: *See*—
Akashi, Akira; Kadohara, Terutake; Ohnuki, Ichiro; and Higashihara, Masaki, 5,005,037, Cl. 354-400.000.
Arahara, Kozo; Fukui, Tetsuro; Fukumoto, Hiroshi; Katayama, Masato; and Takasu, Yoshio, 5,004,667, Cl. 430-255.000.
Fukushima, Nobuo; Sakai, Shinji; Takdea, Osamu; Takei, Masahiro; Suzuki, Yasutomo; Okino, Tadashi; and Jinnai, Shigeru, 5,005,088, Cl. 360-69.000.
Kataoka, Kenichi; and Tsukimoto, Takayuki, 5,004,964, Cl. 318-128.000.
Miyakawa, Akira; and Inoue, Hiroyuki, 5,005,025, Cl. 346-25.000.
Nishimura, Yukuo; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Nakagiri, Takashi; Saito, Kenji; Kimura, Toshiaki; Matsuda, Hiroshi; Sakai, Kunihiro; and Miyazaki, Toshihiko, 5,004,671, Cl. 430-286.000.
Ogawa, Yukio; Hirohata, Michio; Kodaira, Takanori; and Miyawaki, Makoto, 5,005,038, Cl. 354-400.000.
Otokawa, Mitsuhiro; and Takimoto, Hiroyuki, 5,004,965, Cl. 318-254.000.
Saijo, Yasutsugu; Chiku, Kazuyoshi; and Onoda, Shigeyoshi, 5,004,336, Cl. 353-122.000.
Sasaki, Kenichi, 5,004,326, Cl. 350-375.000.
Suda, Yasuo; Ohtaka, Keiji; Suzuki, Kenji; Ishizaki, Akira; and Aoyama, Keisuke, 5,005,041, Cl. 354-407.000.
Suzuki, Akio; Takada, Yoshihiro; Izumizaki, Masami; and Danzuka, Toshimitsu, 5,004,928, Cl. 250-559.000.
Suzuki, Masayuki; and Hattori, Jun, 5,004,328, Cl. 350-416.000.
Takahashi, Hiroto; Karita, Seiichiro; and Sato, Koichi, 5,005,024, Cl. 346-1.100.
Tamura, Yasuyuki; and Kaneko, Shuzo, 5,005,028, Cl. 346-76.00R.
Cantwell, Hugh F., to Rolls-Royce plc. Self-checking speed governor arrangement. 5,003,769, Cl. 60-39.281.
Capdebosco, Bernard, to Siemens Aktiengesellschaft. Device for fastening a die on a tool carrier cylinder of a rotary machine. 5,003,854, Cl. 83-331.000.
Carda, Dan D.: *See*—
Dunn, Wendell E., Jr.; Carda, Dan D.; and Storbeck, Timothy A., 5,004,500, Cl. 75-422.000.
Cardani, Silvestro; and Pareschi, Flavio, to SGS-Thomson Microelectronics S.r.l. Apparatus for treating silicon wafers in an acid bath. 5,003,999, Cl. 134-105.000.
Cardinal Scale Manufacturing Company: *See*—
Langford, Stephen R.; Stone, James R.; and Bagley, William C., 5,004,058, Cl. 177-25.130.
Carey, Michael J.; and Anderson, Adrian J., to Mitel Telecom Limited. Wireless telephone system. 5,005,183, Cl. 375-1.000.
Cargo Master Incorporated: *See*—
Thomas, John F., 5,004,293, Cl. 296-166.000.
Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co.: *See*—
Pflaum, Hermann; and Strehler, Richard, 5,003,817, Cl. 73-118.100.
Carl-Zeiss-Stiftung: *See*—
Kuchel, Michael, 5,004,346, Cl. 356-360.000.
Carleton, Roland A. Detachable amber lens for a vehicle. 5,005,109, Cl. 362-61.000.
Carlqvist, Stig G., to Stig G. Carlqvist Motor Consultant, (C.M.C.) Aktiebolag. Motion transmitting mechanism. 5,003,832, Cl. 74-51.000.
Carlson, Casey L.: *See*—
Stumpf, William E.; Carlson, Casey L.; Knape, Richard S.; and Bessinger, Walter L., 5,004,202, Cl. 248-243.000.
Carlson, Edwin D.: *See*—
Hildinger, Henry W.; and Carlson, Edwin D., 5,004,862, Cl. 585-867.000.
Carlson, Harold L.; DeWitt, Michael D.; Martel, Louis, Jr.; Kelley, Larry W.; and Tayon, Jeffrey E., to Orschein Co. Electromechanical parking brake system. 5,004,077, Cl. 188-2.00D.
Carlsson, Borje. Method and an arrangement for filling large sacks. 5,004,022, Cl. 141-114.000.
Carney, Jayne F.: *See*—
Roberts, Katherine P.; Geiger, Jon R.; and Carney, Jayne F., 5,004,682, Cl. 435-6.000.
Carpenter, Billy L.: *See*—
White, Curtis D.; and Carpenter, Billy L., 5,003,985, Cl. 128-716.000.
Carpenter, Dewey; and Ehster, Kathryn. Paper item receptacle. 5,004,099, Cl. 206-83.500.

Carr, Noel R., to Supertruss Pty. Ltd. Metal frame structure. 5,003,748, Cl. 52-693.000.

Carrier Corporation: *See—*
Drucker, Alan S., 5,004,008, Cl. 137-504.000.
Meier, Paul R.; and Mueller, Brian D., 5,004,047, Cl. 165-158.000.

Carter, John G., to Battelle Memorial Institute. Method for initiating in-situ vitrification using an impregnated cord. 5,004,373, Cl. 405-131.000.

Casio Computer Co., Ltd.: *See—*
Minamitaka, Junichi, 5,003,860, Cl. 84-609.000.
Tsukamoto, Akihiro; and Kobayashi, Keiichi, 5,005,013, Cl. 340-825.440.

Castaldi, Graziano; and Giordano, Claudio, to Zambon S.p.A. Preparing alpha-arylalkanoic acids. 5,004,832, Cl. 562-490.000.

Castaldo, Ronald. Long span sprue tube for investment casting. 5,004,037, Cl. 164-244.000.

Castaneda, Janet Y.: *See—*
Lochhead, Robert Y.; Castaneda, Janet Y.; and Hemker, Wilfred J., 5,004,598, Cl. 424-59.000.

Caterpillar Inc.: *See—*
Custer, Bruce C., 5,004,081, Cl. 180-68.500.

Catlin, Robert W., to Chips & Technologies, Inc. Apparatus for selectively providing RAS signals or RAS timing and coded RAS address signals. 5,005,157, Cl. 365-193.000.

Cattaneo, Pierr; and Gudel, Claude, to Liasons Electroniques-Mecaniques. Electric current sensing device. 5,004,974, Cl. 324-117.00R.

Cattarozzi, Andrea. Modular sectional container which can be transported manually, for conserving substances, in particular for alimentary use. 5,004,116, Cl. 220-4.340.

Caulfield, H. John; Hester, Charles F.; Kinser, Jason M.; and Shamir, Joseph, to Teledyne Brown Engineering. Neural processor with holographic optical paths and nonlinear operating means. 5,004,309, Cl. 350-3.680.

Caya, Mario. Bunk bed with ladder. 5,003,650, Cl. 5-9.100.

Caza, Lawrence A.: *See—*
Unger, William; and Caza, Lawrence A., 5,003,904, Cl. 114-140.000.

Ceccucci, Rudolph R., Jr. Mechanical tool for manipulating fittings and caps. 5,003,848, Cl. 81-176.200.

Cedarapids, Inc.: *See—*
Goodwin, Jon D.; and Musil, Joseph E., 5,004,394, Cl. 414-346.000.
Ostergaard, David A., 5,004,169, Cl. 241-192.000.

Central Glass Company, Limited: *See—*
Aramaki, Minoru; Suenaga, Takashi; Sakaguchi, Hiroaki; and Hamana, Takanori, 5,004,829, Cl. 562-113.000.

Cerberus AG: *See—*
Ryser, Peter; and Strassler, Sigfrid, 5,005,003, Cl. 340-587.000.

Cerestar Holding B.V.: *See—*
Krause, Frank; and Kniewske, Reinhard, 5,004,767, Cl. 524-30.000.

Cetus Corporation: *See—*
Hershenson, Susan; and Thomson, Jody, 5,004,605, Cl. 424-85.600.

CGR MeV: *See—*
Vassenaix, Michel; and Milcamps, Jacques, 5,004,926, Cl. 250-492.300.

Chalupa, William; Kronfeld, David S.; Schneider, Paul L.; and Sklan, David, to University of Pennsylvania, The Trustees of the. Methods of increasing milk yields in ruminants. 5,004,728, Cl. 514-12.000.

Chambers, Robert K.: *See—*
Ashton, Michael J.; Bridge, Andrew W.; Chambers, Robert K.; Dron, Donald I.; Fenton, Garry; Harris, Neil V.; Lythgoe, David J.; McFarlane, Ian M.; Newton, Christopher G.; Riddell, David; Smith, Christopher; Stuttle, Keith A. J.; and Toft, Malcolm P., 5,004,747, Cl. 514-309.000.

Chan, Yet, to Achiever Industries, Ltd. Camera mechanism. 5,005,034, Cl. 354-204.000.

Chaney, Raymond J.; McMurtry, David R.; and Wilson, David, to Reinshaw plc. Scales for position determining apparatus having marks of different amplitudes thereon. 5,004,982, Cl. 324-207.220.

Chang, David B.: *See—*
Vali, Victor; Chang, David B.; and Brownrigg, Patrick C., 5,004,914, Cl. 250-227.270.

Charles Packaging Corporation: *See—*
Blezard, Robert C., 5,004,093, Cl. 198-430.000.

Chau, Tommy L.: *See—*
Cherukuri, Subraman R.; Chau, Tommy L.; Raman, Krishna P.; and Orama, Angel M., 5,004,595, Cl. 424-48.000.

Chen, Chun-Teh. Submerged-type gas cleaning system. 5,004,486, Cl. 55-222.000.

Chen, Evan N., to Warner-Lambert Company. Flexible razor head. 5,003,694, Cl. 30-49.000.

Chen, Hai C.; and Yeh, Felix W. H. Apparatus for controlling an electric elevator. 5,004,076, Cl. 187-130.000.

Chen, Kueing-Long, to Texas Instruments Incorporated. Self-aligned NPN bipolar transistor built in a double polysilicon CMOS technology. 5,005,066, Cl. 357-43.000.

Chen, Michael, to Advance Security Inc. Central lock control system adapted for automobile. 5,004,931, Cl. 307-10.200.

Chen, Shu-zi; and Wilson, Geoffrey G., to New England Biolabs, Inc. Method for producing the ACCI restriction endonuclease and methylase. 5,004,691, Cl. 435-172.300.

Chen, Yue Z.: *See—*
Yu, Meng W.; Su, Shihuai; Chen, Yue Z.; Zheng, Ticheng; Ji, Kebin; Ling, Shou R.; Lin, Jian C.; Deng, Jianhui; and Zhang, Kunwu, 5,004,510, Cl. 148-146.000.

Cheng, Syh Y.; and Wang, Hong W., to Industrial Technology Research Institute. Heat cycle treatment for improving the performance of piezoelectric ceramics. 5,004,555, Cl. 252-62.900.

Cherukuri, Subraman R.; Chau, Tommy L.; Raman, Krishna P.; and Orama, Angel M., to Warner-Lambert Company. Multiple encapsulated flavor delivery system and method of preparation. 5,004,595, Cl. 424-48.000.

Cheski, Ronald A.: *See—*
Grunert, Kurt A.; Pabon, Delfin; and Cheski, Ronald A., 5,005,104, Cl. 361-355.000.

Chevron Research & Technology Company: *See—*
Nisula, Scott P.; and O'Callaghan, Christopher P., 5,004,588, Cl. 423-226.000.

Chicago Bridge & Iron Technical Services Company: *See—*
Engdahl, Gerald E.; and Shah, Tushar K., 5,003,784, Cl. 62-124.000.

Chih, Hsieh C. Toy submachine gun. 5,004,444, Cl. 446-406.000.

Chiku, Kazuyoshi: *See—*
Saijo, Yasutsugu; Chiku, Kazuyoshi; and Onoda, Shigeyoshi, 5,004,336, Cl. 353-122.000.

Chino, Masashi: *See—*
Hashimoto, Toru; Takabatake, Masato; Chino, Masashi; and Takahashi, Akira, 5,004,981, Cl. 324-207.220.

Chips & Technologies, Inc.: *See—*
Catlin, Robert W., 5,005,157, Cl. 365-193.000.

Chisso Corporation: *See—*
Yamamoto, Tetsushi; Niwano, Masaru; and Nakagawa, Etsuo, 5,003,919, Cl. 118-716.000.

Chitty, Gordon W.: *See—*
Kalinoski, Richard W.; Chitty, Gordon W.; and Vignos, James H., 5,003,827, Cl. 73-861.240.

Choi, Jay J. Laryngoscope with double-angle blade. 5,003,962, Cl. 128-11.000.

Choi, Won-Taek: *See—*
Kwon, Oh-Hyun; Jang, Taek-Yong; Shin, Jung-Hyun; and Choi, Won-Taek, 5,005,103, Cl. 361-313.000.

Chong, Leang H.: *See—*
Teleki, Bela; Holden, Alan G.; and Chong, Leang H., 5,004,991, Cl. 333-168.000.

Choquette, Paul, to Corporation Salaison Melrose. Process for cooking and shaping meat pieces. 5,004,622, Cl. 426-513.000.

Chrysler Corporation: *See—*
Candea, Cornell, 5,003,683, Cl. 29-425.000.
Markow, Paul A.; Nolle, William; and Beli, Charles L., 5,004,976, Cl. 324-154.00R.
Moote, Richard K.; Weber, Gregory T.; and Robinson, William O., 5,003,944, Cl. 123-299.000.
Timmins, Lawrence J.; and Krause, Duane K., 5,004,102, Cl. 206-386.000.
Weglarz, Michael W.; Vincent, Michael T.; Prestel, James F.; and Sisoler, Paul G., 5,003,952, Cl. 123-478.000.
Weglarz, Michael W.; Vincent, Michael T.; Prestel, James F.; and Sisoler, Paul G., 5,003,953, Cl. 123-478.000.

Chu, Jau-Jier: *See—*
Liu, Ru-Shi; Huang, Yao-Tsung; Chu, Jau-Jier; and Liang, Jiuh-Ming, 5,004,723, Cl. 505-1.000.

Chu, Robert J. Portable boot drying apparatus. 5,003,707, Cl. 34-104.000.

Chuma, Yoshihiro: *See—*
Narikiyo, Hidetoshi; Gotou, Yukifumi; and Chuma, Yoshihiro, 5,004,149, Cl. 236-49.300.

Chung, In J.: *See—*
Oh, Myung H.; Lee, Kyung J.; Chung, In J.; Lee, Nam Y.; and Kim, Myung S., 5,004,573, Cl. 264-61.000.

Chung, Wilson. Flush controller for a toilet bowl. 5,003,643, Cl. 4-313.000.

Church, Fred E.: *See—*
Young, Alfred; and Church, Fred E., 5,004,141, Cl. 227-112.000.

Churchill, Jonathan D.; and Volmary, William T., to Kohler Co. Stepper motor throttle controller. 5,003,948, Cl. 123-352.000.

Chvertko, Anatoly I.: *See—*
Juschenko, Konstantin A.; Varenchuk, Pavel A.; Kovalev, Valentin D.; Chvertko, Anatoly I.; Privalov, Nikolai T.; and Kuzmenko, Vladimir G., 5,004,885, Cl. 219-73.200.

Chyugoku Paalu Distributing Corporation: *See—*
Miyake, Teruyoshi; and Yamamoto, Tatsuo, 5,003,638, Cl. 2-167.000.

Ciaramitaro, William: *See—*
Lipchak, John B.; Oblak, Tod A.; Bednar, Fred H.; Ciaramitaro, William; Hughes, Francis R.; Smith, John R.; and Gisoni, Gregory A., 5,005,142, Cl. 364-550.000.

Ciba-Geigy Corporation: *See—*
Cortolano, Frank P.; Seltzer, Raymond; and Patel, Ambelal R., 5,004,770, Cl. 524-99.000.
Dingwall, John G.; Ehrenfreund, Josef; Hall, Roger G.; and Jack, James, 5,004,826, Cl. 558-169.000.
Kvita, Vratislav, 5,004,814, Cl. 549-294.000.
Mutterer, Francis; and Berger, Kurt, 5,004,759, Cl. 524-89.000.
Phaff, Rox; and Bedekovic, Davor, 5,004,813, Cl. 548-463.000.
Rink, Hans, 5,004,781, Cl. 525-54.110.
Storni, Angelo, 5,004,755, Cl. 514-653.000.

Cincinnati Milacron, Inc.: *See—*
Morser, Alfred H.; Gildemeister, Walter M.; and Farmer, David M., 5,005,135, Cl. 364-474.350.

Ciupak, Lawrence F. Chopper with auto feed. 5,003,855, Cl. 83-346.000.

Claar, Terry D.; Johnson, William B.; and Rapp, Robert A., to Lanxide Technology Company, LP. Method of modifying ceramic composite bodies by a post-treatment process and articles produced thereby. 5,004,714, Cl. 501-134.000.

Clark, Adrian P., to National Research Development Corporation. Channel estimation and detection for digital communication systems. 5,005,188, Cl. 375-94.000.

Clark Equipment Company: *See—*
Wagner, Oryn B.; and Alm, Terry J., 5,004,398, Cl. 414-723.000.

Clarke, Donald A.: *See—*
Pryor, Timothy R.; Hageniers, Omer L.; Pastorius, Walter J.; Liptay-Wagner, Nicholas; and Clarke, Donald A., 5,004,339, Cl. 356-241.000.

Clarke, Roger W.: *See—*
Lyons, Nicholas; Baxter, William R. S.; Woodward, Adrian M.; and Clarke, Roger W., 5,004,542, Cl. 210-356.000.

Claude, Jacques, to Intertechnique. Device for connecting a breathing mask to a helmet. 5,003,632, Cl. 2-6.000.

Cleanlite Aire Inc.: *See—*
Suzuki, Atsushi, 5,004,600, Cl. 424-76.300.

Clinkenbeard, Jack L., to Ashland Oil, Inc. Automatic total reducers monitoring and adjustment system. 5,004,696, Cl. 436-51.000.

Clough, John M.: *See—*
Sugavanam, Balasubramanyan; Worthington, Paul A.; and Clough, John M., 5,004,494, Cl. 71-92.000.

Cobb, Michael E.: *See—*
Hillman, Robert S.; Cobb, Michael E.; Allen, Jimmy D.; Gibbons, Ian; Ostoich, Vladimir E.; and Winfrey, Laura J., 5,004,923, Cl. 250-341.000.

Cocherell, Francis E.; Harper, Homer C.; and Hsieh, George. Anhydrous toothpaste or dental cream composition. 5,004,596, Cl. 424-52.000.

Cockram, David J.; and Cockram, Edgar S. R., to Actronic Lighting CC. Ignition device for a gas discharge lamp. 5,004,960, Cl. 315-307.000.

Cockram, Edgar S. R.: *See—*
Cockram, David J.; and Cockram, Edgar S. R., 5,004,960, Cl. 315-307.000.

Cody, George D.: *See—*
Baker, Charles L.; Cody, George D.; Joseph, Craig A.; and Sela, Uri, 5,004,152, Cl. 239-8.000.

Cohen, Charles M.; and Crea, Roberto, to Creative Biomolecules, Inc. Process for producing human epidermal growth factor and analogs thereof. 5,004,686, Cl. 435-69.100.

Cohen, Leslie A.: *See—*
Hallden-Abberton, Michael P.; Bortnick, Newman M.; Cohen, Leslie A.; Freed, William T.; and Fromuth, Harry C., 5,004,777, Cl. 524-433.000.

Cohen, Samuel; and Manne, Liora G. Needle felted fabrics. 5,003,674, Cl. 28-109.000.

Colbert, Henry J.: *See—*
Doone, Rodney M.; and Colbert, Henry J., 5,003,689, Cl. 29-613.000.

Cole, James M.: *See—*
Mixon, Larry C.; Snyder, George W.; Hill, Scott D.; Johnson, Gregory L.; Wlodarski, J. Frank; von Spakovsky, Alexis P.; Emerson, John D.; Cole, James M.; and Tipton, John P., 5,003,883, Cl. 102-476.000.

Coleman, Paula M.; and Luecke, Mark T., to Lewis Gallob Toys, Inc. Dollhouse within a dollhouse. 5,004,445, Cl. 446-478.000.

Colgate-Palmolive Company: *See—*
Julemont, Michel; Zocchi, Germaine; Mineo, Nunzio; and Fonsny, Pierre, 5,004,556, Cl. 252-99.000.

Collet, Marnix G.: *See—*
Bakker, Jacobus G. C.; and Collet, Marnix G., 5,005,062, Cl. 357-24.000.

Collett, Donald H. Method and apparatus for cleaning and sanitizing HVAC systems. 5,003,998, Cl. 134-22.120.

Colli, Luigi; Badiali, Roberto; and Marangone, Nereo, to Savio S.p.A. High-productivity bobbin winding method and devices for its implementation. 5,004,171, Cl. 242-35.60R.

Collins, Donald A., Jr., to NCR Corporation. Scanning system having automatic laser shutdown upon detection of defective scanning element motion. 5,004,916, Cl. 250-235.000.

Colliva, Giovanni. Principles and appliances for the cutting of spherical-faceted gems and gems thus obtained. 5,003,791, Cl. 63-32.000.

Columbia in the City of New York, The Trustees of: *See—*
Stefaniak, Philip S.; and Fine, Daniel H., 5,004,124, Cl. 222-136.000.

Colwell, Joseph G., Jr., to J. M. Huber Corporation. Superconducting magnetic separator. 5,004,539, Cl. 210-222.000.

Combi Co., Ltd.: *See—*
Nakao, Shinroku; Suzuki, Yoshiyuki; and Kato, Hitoshi, 5,004,253, Cl. 280-47.380.

Communications Satellite Corporation: *See—*
Zaghloul, Amir I.; and Sorbello, Robert M., 5,005,019, Cl. 343-700.0MS.

Communications Test Design, Inc.: *See—*
Parsons, Gerald J.; Greenwald, Brian D.; McGrath, John J.; and Andrasko, Stephen W., 5,005,197, Cl. 379-21.000.

Compuadd Corporation: *See—*
Mast, Thomas R., 5,004,867, Cl. 174-35.0GC.

Concord Industries, Inc.: *See—*
Somers, James S., 5,004,177, Cl. 242-99.000.

Connell, Richard A.; Keating, Raymond; Sansone, Ronald P.; and Schumacher, Karl H., to Pitney Bowes Inc. Method and apparatus for categorizing and certifying mail. 5,005,124, Cl. 364-401.000.

Conner, Lowell J.: *See—*
Borer, John W.; Skilliter, William J.; and Conner, Lowell J., 5,004,492, Cl. 65-289.000.

Connors, Peter J.; Scully, Sean; Bria, Frank; and ReFalo, John, III, to Remcon Plastics, Inc. Tool storage box. 5,004,103, Cl. 206-372.000.

Conoco Inc.: *See—*
Rosendahl, Finn; Fjeld, Svein; Salama, Mamdouh M.; and Gillen, Michael P., 5,004,051, Cl. 166-357.000.

Conprinta Ltd.: *See—*
Lauber, Peter, 5,003,873, Cl. 101-219.000.

Constantinou, Dennis: *See—*
Edelman, William; Constantinou, Dennis; Stefanovski, Miles; Jan, Yuh L.; Fahlen, Theodore S.; Hansen, Ronald L.; and Kramasz, Kenneth J., 5,005,180, Cl. 372-57.000.

Conway, Joseph. Display case. 5,004,303, Cl. 312-140.000.

Cook, Charles T. Studio easel. 5,004,204, Cl. 248-449.000.

Cook, George W. Oral appliance for improving breathing and methods of using and making same. 5,003,994, Cl. 128-848.000.

Cook, Stephen D., to Tulane University. Porous coated total hip replacement system. 5,004,476, Cl. 623-23.000.

Cooke, Kevin K.; Dewitt, John R.; Galinis, Paul J.; and Koteff, Walter B., to International Business Machines Corp. Self-contained grounding strip. 5,004,866, Cl. 174-35.0GC.

Cooper Industries, Inc.: *See—*
Korczynski, Jacek M.; and Stack, Thomas J., 5,004,994, Cl. 337-66.000.
Lipscomb, Dennis E.; Wilhelm, Gary L.; Perna, Barbara G.; and Guenthner, Waldemar G., 5,003,695, Cl. 30-193.000.

Copal Co., Ltd.: *See—*
Ohzeki, Yoshiyuki; and Amikura, Kazuo, 5,004,941, Cl. 310-49.00R.

Cordery, Robert A., to Pitney Bowes Inc. Field generation and reception system for electronic article surveillance. 5,005,001, Cl. 340-551.000.

Corning Incorporated: *See—*
Bardhan, Pronob; and Yu, Chyang J., 5,004,713, Cl. 501-134.000.

Corporation Salaison Melrose: *See—*
Choquette, Paul, 5,004,622, Cl. 426-513.000.

Corry, Durrell. Rain gutter support and mounting bracket. 5,004,191, Cl. 248-48.200.

Cortec, Inc.: *See—*
Dingwall, Robert P.; and Bellin, Howard T., 5,003,983, Cl. 128-704.000.

Cortolano, Frank P.; Seltzer, Raymond; and Patel, Ambelal R., to Ciba-Geigy Corporation. Polymeric substrates stabilized with N-substituted hindered amines. 5,004,770, Cl. 524-99.000.

Costanza, Daniel W.: *See—*
Stokes, Ronald E.; Nowak, William J.; Attardi, Anthony A.; and Costanza, Daniel W., 5,005,054, Cl. 355-273.000.

Costanza, John R.: *See—*
Vicari, Richard; Costanza, John R.; Lamonte, Ronald R.; and Miano, Ralph M., 5,004,796, Cl. 528-179.000.

Cotton Incorporated: *See—*
Wilkes, Lambert H.; Mehner, Martin; and Lalor, William F., 5,003,669, Cl. 19-49.000.

Couasnard, Claude: *See—*
Bergero, Jean-Pierre; and Couasnard, Claude, 5,004,990, Cl. 333-22.00R.

Coulon, Jean-Claude: *See—*
Kawahara, Hideo; Sakata, Nobuhiro; Coulon, Jean-Claude; and Lovera, Patrick, 5,004,503, Cl. 106-287.180.

Councilman, Richard R., to Zebco Corporation. Convertible bail opening system. 5,004,182, Cl. 242-232.000.

Courtright, David A.: *See—*
O'Connor, James T.; and Courtright, David A., 5,005,191, Cl. 375-116.000.

Cousin, Michel: *See—*
Boinot, Francois; Cousin, Michel; Francois, Pierre-Michel; and Michel-Dansac, Francois, 5,004,789, Cl. 525-506.000.

Cousminer, Joseph J.: *See—*
Shanbhag, Sudhakar P.; Cousminer, Joseph J.; and Milani, Gerald, 5,004,616, Cl. 426-102.000.

Cowan, Jack C.: *See—*
House, Roy F.; Wilkinson, Andree H.; and Cowan, Jack C., 5,004,553, Cl. 252-8.510.

Craig, William S.; and Siegel, Robert S., to Phillips Petroleum Company. Purification of hepatitis proteins. 5,004,688, Cl. 435-69.300.

Crass, Matthew M.: *See—*
Becker, Thomas P.; Rameshk, Sohrab S.; and Crass, Matthew M., 5,004,984, Cl. 324-402.000.

Crawford, Paul M.; Campbell, Herbert W.; Myers, Michael J.; and Siverns, Steven L., to Lenon Enviornmental Inc. Sampling processes for use in the controlled addition of conditioning material to suspensions, sludges and the like and apparatus thereof. 5,003,814, Cl. 73-59.000.

Crea, Roberto: *See—*
Cohen, Charles M.; and Crea, Roberto, 5,004,686, Cl. 435-69.100.

Creative Biomolecules, Inc.: *See—*
Cohen, Charles M.; and Crea, Roberto, 5,004,686, Cl. 435-69.100.

Creative Techniques, Inc.: *See—*
Salloum, James S., 5,004,179, Cl. 242-118.600.

Cresswell, Michael W.: *See—*
Kun, Zoltan K.; Cresswell, Michael W.; and Hopkins, Richard H., 5,004,956, Cl. 315-169.300.

Crisafulli, Jerry: *See*—
Kleven, Lawrence P.; Agranat, Edward A.; Crisafulli, Jerry; Robinson, Hugh; Smith, David J.; Wiseley, Thomas; Fortier, Richard C.; Johnson, Severne; and Menzin, Marvin, 5,004,954, Cl. 315-106.000.

Crisanti, Mark M.: *See*—
Majeti, Satyanarayana; Guay, Christopher B.; and Crisanti, Mark M., 5,004,597, Cl. 424-52.000.

Cristine, John: *See*—
Bullard, James R.; Muller, Richard P.; Grossi, Benedetto; and Cristine, John, 5,003,963, Cl. 128-11.000.

Cronje, Izak J.: *See*—
Dekker, Johannes; and Cronje, Izak J., 5,004,831, Cl. 562-475.000.

Cruden, John M.: *See*—
Mahil, Mahinder S.; and Cruden, John M., 5,004,768, Cl. 524-30.000.

Csajagi, Eva: *See*—
Jekkel nee Bokany, Antonia; Albrecht, Karoly; Ambrus, Gabor; Lang, Tibor; Szabo, Istvan M.; Ilkoy, Evs; Konczol, Kalman; Moravcsik, Imre; Hantos, Gabor; Simonovits, Emilia; Lengyel nee Szemenyei, Zsuzsanna; Vida, Zsuzesanna; and Csajagi, Eva, 5,004,695, Cl. 435-253.100.

Cubic Defense Systems: *See*—
Shannon, Leland K.; Gentry, Ted L.; and Le, Toby, 5,003,811, Cl. 73-12.000.

Culbertson, Samuel W.; and Williams, Keith G., to Binks Manufacturing Company. Pressure responsive drivers for reciprocating pump and method. 5,004,403, Cl. 417-53.000.

Cumbie, Carlyen F. Lock for retainer pin. 5,004,390, Cl. 411-340.000.

Cummings, Ernie W., to Drain-All, Inc. Automatic drain valve. 5,004,004, Cl. 137-195.000.

Cummiskey, Peter; Epstein, Marvin; Gilmour, Paul A.; and Kim, Richard, to ITT Corporation. Multirate wire line modem apparatus. 5,005,168, Cl. 370-24.000.

Cunningham, David G.: *See*—
Booth, Richard C.; Beaumont, Alan R.; Daymond-John, Barbara E.; Cunningham, David G.; and Stallard, William A., 5,004,314, Cl. 350-96.140.

Cunningham, David W., to Lee Colortran, Inc. Dimming control circuit. 5,004,957, Cl. 315-199.000.

Curnutt, Gerald L., to Dow Chemical Company, The. Catalytic vapor phase process for producing dihydrocarbyl carbonates. 5,004,827, Cl. 558-277.000.

Custer, Bruce C., to Caterpillar Inc. Battery restraint system. 5,004,081, Cl. 180-68.500.

Custom Chrome, Inc.: *See*—
Hoeptner, Herbert W., 5,003,945, Cl. 123-310.000.

Czarn, David A.: *See*—
Sogge, Dale R.; O'Brien, Edward F.; and Czarn, David A., 5,004,876, Cl. 200-83.00P.

D.O.C.C., Inc.: *See*—
Bricken, Jonathan, 5,003,892, Cl. 110-346.000.

Da Costa, Caio M. F. N., to Empresa Brasileira De Compressores S/A Embraco. Discharge system for rotary rolling piston compressor. 5,004,408, Cl. 418-15.000.

Da Costa, Caio M. F. N., to Empresa Brasileira de Compressores-S/A-Embraco. High frequency noise suppressor for hermetic rotary compressors. 5,004,410, Cl. 418-63.000.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See*—
Yada, Akira; and Matsumoto, Shusaku, 5,004,761, Cl. 522-3.000.

Daibov, Sergei V.: *See*—
Goikhman, Yakov A.; Krjukov, Georgy M.; Onotsky, Melis I.; Sorokin, Georgy M.; Filatov, Alexei V.; Tsarapkin, Viktor V.; Yakimov, Vadim P.; Smirnov, Gennady A.; Nikiforov, Ivan I.; Burdukovsky, Alexandr I.; Daibov, Sergei V.; and Kurdjukov, Alexandr S., 5,004,056, Cl. 175-293.000.

Daidoh, Yoshimasa: *See*—
Aono, Yoshihito; Iwamatsu, Takanori; Minowa, Morihiko; Takenaka, Sadao; Daidoh, Yoshimasa; Nakamura, Hiroshi; and Fujino, Nobutsugu, 5,005,186, Cl. 375-82.000.

Daikin Industries Ltd.: *See*—
Tohzuka, Takashi; Yamamoto, Ikuo; and Misugi, Yoshihiko, 5,004,554, Cl. 252-54.600.
Yoshida, Tutomu; and Iida, Shigeharu, 5,004,825, Cl. 558-131.000.

Daikuhara, Yasushi: *See*—
Gohda, Eiichi; Tsubouchi, Hirohito; Nakayama, Hiroyuki; Hirono, Shuichi; Takahashi, Kozo; Hashimoto, Shuji; and Daikuhara, Yasushi, 5,004,805, Cl. 530-399.000.

Daimler-Berg AG: *See*—
Bauer, Theodor; and Zweigart, Gerhard, 5,004,291, Cl. 296-116.000.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Yahata, Makoto; and Nishida, Fumihiko, 5,005,044, Cl. 355-40.000.

Daley, Peter A., to Dynamic Foam Products, Inc. Custom insole for athletic shoes. 5,003,708, Cl. 36-44.000.

Dalferth, G. Robert, to Morlock Mechanik GmbH. Device for applying color to a block of a tampon printing machine. 5,003,872, Cl. 101-163.000.

Dallas Semiconductor Corporation: *See*—
Kurkowski, Hal, 5,005,151, Cl. 364-900.000.

D'Amato, Salvatore F.; Sorbo, Peter; and Dunning, Richard E., to American Bank Note Holographics, Inc. Apparatus for printing and for forming a hologram on sheet material. 5,003,915, Cl. 118-46.000.

Dambre, Pierre, to Elevage Avicole de la Bohardiere. Egg incubation carriage for a ventilated incubation enclosure. 5,003,924, Cl. 119-44.000.

Danheiser, Rick L.; and Nowick, James S., to Massachusetts Institute of Technology. Method for synthesizing β-lactones and alkenes. 5,004,815, Cl. 549-328.000.

Daniel, Kenneth J.: *See*—
Rumbaugh, James E.; and Daniel, Kenneth J., 5,005,119, Cl. 364-200.000.

Dankwort, Rudolph C.; and Klem, Charles D., to Honeywell Inc. Time multiplexed fiber optic sensor. 5,004,911, Cl. 250-227.210.

Danzuka, Toshimitsu: *See*—
Suzuki, Akio; Takada, Yoshihiro; Izumizaki, Masami; and Danzuka, Toshimitsu, 5,004,928, Cl. 250-559.000.

Daoud, Bassel H., to AT&T Bell Laboratories. Interconnection device. 5,004,433, Cl. 439-502.000.

Das, Sajal; and Prevorsek, Dusan C., to Allied-Signal Inc. Cyanato group containing phenolic resins, phenolic triazines derived therefrom. 5,004,788, Cl. 525-504.000.

Dashevsky, Norm. Agricultural sprayer. 5,004,155, Cl. 239-127.000.

Dato, Paul: *See*—
Grage, Ludger; and Dato, Paul, 5,005,083, Cl. 358-181.000.

David Clark Company Incorporated: *See*—
Bassick, John W.; and Dubois, Edward A., 5,003,630, Cl. 2-2.10A.

Davy McKee (London) Limited: *See*—
Bradley, Michael W.; Harris, Norman; and Turner, Keith, 5,004,845, Cl. 568-885.000.

Dayco Products-Eaglemotive, Inc.: *See*—
Settles, David J., 5,003,685, Cl. 29-525.000.

Daymond-John, Barbara E.: *See*—
Booth, Richard C.; Beaumont, Alan R.; Daymond-John, Barbara E.; Cunningham, David G.; and Stallard, William A., 5,004,314, Cl. 350-96.140.

De, Dilip K., to International Superconductor Corp. Superconductive quantum interference device for the non-destructive evaluation of metals. 5,004,724, Cl. 505-1.000.

Deaett, Michael A., to Raytheon Company. Digital sound synthesizer and method. 5,005,204, Cl. 381-51.000.

Dean, Grant, to Ul-Tie-Mate Products, Inc. Tangle resistant pet tie apparatus and method. 5,003,929, Cl. 119-120.000.

De Bastiani, Basilio M.: *See*—
Faccioli, Giovanni; De Bastiani, Basilio M.; Magnan, Bruno; and Soffiatti, Renzo, 5,004,501, Cl. 106-35.000.

De Castelli, Giorgio: *See*—
Barbagli, Rino O.; and De Castelli, Giorgio, 5,004,060, Cl. 180-6.440.

DeCaul, Lorenzo C.; Han, Scott; Palermo, Robert E.; and Walsh, Dennis E., to Mobil Oil Corporation. Process for upgrading methane to higher hydrocarbons. 5,004,856, Cl. 585-500.000.

DeChristopher, Eugene L. Roller for forming a dough ball into a pizza shell. 5,004,350, Cl. 366-69.000.

DeConti, John P.; and Quenneville, Raymond N., to DeConti, John P. Energy absorbing device and torque measuring apparatus therefor. 5,003,829, Cl. 73-862.120.

deFigueiredo, Rui J. P.: *See*—
Krishen, Kumar; Shaw, Scott W.; and deFigueiredo, Rui J. P., 5,005,147, Cl. 364-578.000.

Deguchi, Toshihisa: *See*—
Sakamoto, Noriaki; Maeda, Shigemi; Yamanaka, Toshihiro; Deguchi, Toshihisa; Horie, Nobuyuki; Yamaguchi, Takeshi; and Kojima, Kunio, 5,005,164, Cl. 369-48.000.

Degussa Aktiengesellschaft: *See*—
Deller, Klaus; Ettlinger, Manfred; Klingel, Rainhard; and Krause, Helmfried, 5,004,719, Cl. 502-242.000.

Dehn, Rudolph A.; and Macdonald, Andrew J., to General Electric Company. Ice detection system. 5,005,015, Cl. 340-962.000.

Dekker, Johannes; and Cronje, Izak J., to National Energy Council. Recovery of humic acids. 5,004,831, Cl. 562-475.000.

Delco Electronics Corporation: *See*—
Bristol, Samuel V., 5,004,509, Cl. 148-23.000.

Delgado, Alex V. Method for reducing immunogenic and/or toxic substances in indoor air. 5,003,750, Cl. 52-742.000.

DelGuidice, Henry L.; and Marsh, Edward K., to AMP Incorporated. Panel mount electrical connector. 5,004,430, Cl. 439-350.000.

Delius, Ulrich: *See*—
Kricheldorf, Hans-Rytger; Delius, Ulrich; and Wehrmann, Rolf, 5,004,836, Cl. 568-333.000.

Deller, Klaus; Ettlinger, Manfred; Klingel, Rainhard; and Krause, Helmfried, to Degussa Aktiengesellschaft. Molded articles based on pyrogenically produced zirconium dioxide method for their manufacture, and use thereof. 5,004,719, Cl. 502-242.000.

DeLozanne, A. L., to Board of Regents, The University of Texas System; and Motorola, Inc. As-deposited oxide superconductor films on silicon and aluminum oxide. 5,004,721, Cl. 505-1.000.

Delsey S.A.: *See*—
Seynhaeve, Andre, 5,003,671, Cl. 24-265.00A.

DeMars, Robert A. Game timing apparatus. 5,005,160, Cl. 368-95.000.

Demuth, Robert: *See*—
Waeber, Rene; Demuth, Robert; Knabenhans, Fritz; and Bachmann, Othmar, 5,003,670, Cl. 19-66.0CC.

Denes, Oscar L.: *See*—
Atkinson, Anthony; Gray, Richard; and Denes, Oscar L., 5,003,693, Cl. 29-849.000.

Deng, Jianhui: *See*—
Yu, Meng W.; Su, Shihuai; Chen, Yue Z.; Zheng, Ticheng; Ji, Kebin; Ling, Shou R.; Lin, Jian C.; Deng, Jianhui; and Zhang, Kunwu, 5,004,510, Cl. 148-146.000.

Denham, Clarence W.: *See*—
Stocking, George E.; Stich, Richard A.; Besore, John K.; and Denham, Clarence W., 5,004,302, Cl. 312-214.000.
Dent, Peter R.; and Bharya, Rajpal S., to Texas Instruments Incorporated. Digital signal processors. 5,005,150, Cl. 364-736.000.
de Oliveira, Antonio M. d. A.; and Staerk, Jakob, to Siemens Aktiengesellschaft. Circuit configuration for accelerated charge reversal of the voltage level of a bus line of an integrated circuit. 5,004,937, Cl. 307-443.000.
Desai, Jay, to Sheldahl, Inc. Rigid flex printed circuit configuration. 5,004,639, Cl. 428-138.000.
Desconclois, Jean-Francois: *See*—
Antoine, Michel; Barreau, Michel; Desconclois, Jean-Francois; Girard, Philippe; and Picaut, Guy, 5,004,745, Cl. 514-254.000.
Design Tool, Inc.: *See*—
Young, Alfred; and Church, Fred E., 5,004,141, Cl. 227-112.000.
De Smedt, Willy P.: *See*—
Vermeulen, Leon L.; Pauwels, Robert S.; De Smedt, Willy P.; and Vervloet, Ludovicus H., 5,004,659, Cl. 430-14.000.
Desurvire, Emmanuel; Giles, Clinton R.; Simpson, Jay R.; and Zyskind, John L., to AT&T Bell Laboratories. Erbium-doped fiber amplifier. 5,005,175, Cl. 372-6.000.
Dethier, Vincent B.: *See*—
Wilson, William B.; DiPietro, Matthew; Neace, Richard K.; Dethier, Vincent B.; Hauss, Raymond G.; and Louk, James R., 5,005,036, Cl. 354-322.000.
Dethlefs, Ralf-Burkhard; Scholz, Bernd; Wysk, Wolfram; and Miefert, Elke, to Felix Schoeller jr. GmbH & Co. KG. Support material for photographic coatings. 5,004,644, Cl. 428-323.000.
Dettbarn, Richard. Insulated wall assembly. 5,003,742, Cl. 52-282.000.
Deutsche Thomson-Brandt GmbH: *See*—
Gleim, Guunter, 5,005,114, Cl. 363-43.000.
Rufray, Jean C.; and Guillon, Jean C., 5,005,073, Cl. 358-21.00R.
Deutschle, Robert, to E. C. H. Will GmbH. Apparatus for manipulating rolls of convoluted paper webs and the like. 5,004,174, Cl. 242-58.600.
Devon, Thomas J.; Phillips, Gerald W.; Puckette, Thomas A.; Stavinoha, Jerome L.; and Vanderbilt, Jeffrey J., to Eastman Kodak Company. Low pressure rhodium catalyzed hydroformylation of olefins. 5,004,823, Cl. 556-136.000.
Devoss, John: *See*—
Jeffrey, Roy R., Jr.; and Devoss, John, 5,003,941, Cl. 123-142.50R.
Dewitt, John R.: *See*—
Cooke, Kevin K.; Dewitt, John R.; Galinis, Paul J.; and Koteff, Walter B., 5,004,866, Cl. 174-35.0GC.
DeWitt, Michael D.: *See*—
Carlson, Harold L.; DeWitt, Michael D.; Martel, Louis, Jr.; Kelley, Larry W.; and Tayon, Jeffrey E., 5,004,077, Cl. 188-2.00D.
Dey, Thomas W., to Eastman Kodak Company. Modified Foucault for testing an imaging device in terms of the encircled energy test. 5,004,337, Cl. 356-124.000.
Dickie, Gerald M.; Liles, Steve L.; and Woldvedt, Alan H. Spill containment system. 5,004,372, Cl. 405-63.000.
Dickinson, Clive F., to Pilkington plc. Producing molten glass and batch components therefor. 5,004,706, Cl. 501-27.000.
Diehl GmbH & Co.: *See*—
Rudolf, Karl; and Ringel, Konrad, 5,003,885, Cl. 102-494.000.
Difflipp, Kurt: *See*—
Franz, Karl-Heinz; Ochs, Heinrich; and Difflipp, Kurt, 5,003,871, Cl. 101-148.000.
Diffracto Ltd.: *See*—
Pryor, Timothy R.; Hageniers, Omer L.; Pastorius, Walter J.; Liptay-Wagner, Nicholas; and Clarke, Donald A., 5,004,339, Cl. 356-241.000.
Dighe, Shyam V.: *See*—
Wolf, Charles B.; Dighe, Shyam V.; Martin, Paul E.; Taylor, Raymond F., Jr.; and Melilli, William J., 5,004,888, Cl. 219-121.520.
DiGiacinto, Peter M.: *See*—
Beaver, Phillip R.; DiGiacinto, Peter M.; Hutchinson, Donald O.; and Vega, Julio J., 5,004,847, Cl. 570-186.000.
Digital Equipment Corporation: *See*—
Bruckert, William F.; and Bissett, Thomas D., 5,005,174, Cl. 371-68.300.
Griffin, David; Campbell, Jonathan; Reilly, Michael; and Rosenbaum, Richard, 5,005,122, Cl. 364-200.000.
Dillman, Robert O.: *See*—
Frincke, James M.; Bartholomew, Richard M.; and Dillman, Robert O., 5,004,606, Cl. 424-85.800.
Dingwall, John G.; Ehrenfreund, Josef; Hall, Roger G.; and Jack, James, to Ciba-Geigy Corporation. Substituted propane-phosphonous acid compounds. 5,004,826, Cl. 558-169.000.
Dingwall, Robert P.; and Bellin, Howard T., to Cortec, Inc. Cardiac monitoring system. 5,003,983, Cl. 128-704.000.
DiNinno, Frank P.; Greenlee, Mark L.; and Salzmann, Thomas N., to Merck & Co., Inc. 2-phenanthrenyl carbapenem antibacterial agents. 5,004,739, Cl. 514-210.000.
Dininno, Frank P.; Salzmann, Thomas N.; and Greenlee, Mark L., to Merck & Co., Inc. 2-phenanthrenyl-carbapenem antibacterial agents. 5,004,740, Cl. 514-210.000.
Dinsmore, Howard. Animal guard for posts. 5,003,734, Cl. 52-101.000.
DiPietro, Matthew: *See*—
Wilson, William B.; DiPietro, Matthew; Neace, Richard K.; Dethier, Vincent B.; Hauss, Raymond G.; and Louk, James R., 5,005,036, Cl. 354-322.000.
DiSalvo, Rick: *See*—
England, Eric; and DiSalvo, Rick, 5,004,118, Cl. 220-216.000.
Dittbrenner, Eric. Electronic speedometer for snow skis. 5,003,820, Cl. 73-181.000.
DiViesti, Anthony M.: *See*—
Yagi, Masanori; DiViesti, Anthony M.; Regnier, Kent E.; Yamada, Shoji E.; and Walse, Alan S., 5,004,429, Cl. 439-326.000.
Dlouhy, Stephen J. Golf practice apparatus. 5,004,243, Cl. 273-195.00A.
Doan, Phong D.: *See*—
Holleman, Timothy W.; Doan, Phong D.; Brennen, Kenneth R.; and Swoyer, John M., 5,003,992, Cl. 128-785.000.
Dobashi, Kenji, to Fuji Xerox Co., Ltd. Apparatus for changing the direction of conveying paper. 5,004,222, Cl. 271-225.000.
Dr. Ing h.c.F. Porsche Aktiengesellschaft: *See*—
Petri, Horst; and Monig, Michael, 5,003,785, Cl. 62-131.000.
Doi, Nobukazu: *See*—
Amano, Tetsuya; Mita, Seiichi; Izumita, Morishi; Doi, Nobukazu; Kaneko, Mamoru; Yamauchi, Hiroto; and Kasai, Susumu, 5,005,184, Cl. 375-14.000.
Dolphin Integration: *See*—
Dupillier, Christian, 5,005,199, Cl. 379-375.000.
Domizio, George T. Removable recess forming insert. 5,004,208, Cl. 249-91.000.
Domtar Inc.: *See*—
Yalpani, Manssur; and Abdel-Malik, Magdy M., 5,004,808, Cl. 536-56.000.
Dong, Dennis F.; and Loftfield, Richard E., to Huron Technologies, Inc. Anodes and method of making. 5,004,626, Cl. 427-58.000.
Donivan, Lawrence J.; and Laukaitis, Joseph F., to Eastman Kodak Company. Control of toner particle charge. 5,005,050, Cl. 355-208.000.
Donley, Paul J., to Graco Inc. Adhesive supply unit. 5,003,916, Cl. 118-429.000.
Donneky, Peter; and Gacs, Peter T., to GEC Mechanical Handling Limited. Airbridge. 5,004,188, Cl. 244-137.002.
Doone, Rodney M.; and Colbert, Henry J., to Bowthorpe EMP Limited. Method and apparatus for manufacturing a surge arrester. 5,003,689, Cl. 29-613.000.
Dorman, Donald R.: *See*—
Shaulov, Avner A.; Herko, Samuel P.; Dorman, Donald R.; and Bhargava, Rameshwar N., 5,004,726, Cl. 505-1.000.
Dornblaser, Norman E.; and Hildermann, David F., to Haines & Emerson, Inc. Inside head inserting apparatus and method. 5,003,753, Cl. 53-415.000.
Dorow, Joachim; and Bleckmann, Gerhard, to BASF Aktiengesellschaft. Apparatus for clamping printing plates. 5,003,878, Cl. 101-415.100.
Dorschner, Terry A.; and Smith, Irl W., to Raytheon Company. Multiple ring paths in one block. 5,004,343, Cl. 356-350.000.
D'Ottavio, Eugene D.; Hawkins, Robert E.; Rodriguez, Stephen S.; and Rychwalski, James, to Shipley Company Inc. Electrophoretic method for applying photoresist to three dimensional circuit board substrate. 5,004,672, Cl. 430-314.000.
Doughty, Dennis J.: *See*—
Seymour, Raymond K.; Hart, Marshall B.; Magnon, Gary D.; von Kannewurff, Michael C.; and Doughty, Dennis J., 5,004,878, Cl. 200-144.00R.
Douglas, Gordon W.: *See*—
Boyse, Edward A.; Broxmeyer, Hal E.; and Douglas, Gordon W., 5,004,681, Cl. 435-2.000.
Dove, Georges: *See*—
Giddey, Claude; and Dove, Georges, 5,004,623, Cl. 426-564.000.
Dow Chemical Company, The: *See*—
Curnutt, Gerald L., 5,004,827, Cl. 558-277.000.
Durham, George R.; and Hebert, Randy S., 5,004,851, Cl. 585-260.000.
Lee, Guo-shuh J.; Garces, Juan M.; Maj, Joseph J.; and Rocke, Stephen C., 5,004,841, Cl. 568-678.000.
Patton, Robert T.; Vaughn, Walter L.; and McKeand, Thomas J., Jr., 5,004,760, Cl. 521-149.000.
Dow Corning Corporation: *See*—
Maxson, Myron T., 5,004,792, Cl. 528-15.000.
Doyle, Pat. Locking device for removable tailgate assembly. 5,004,287, Cl. 296-57.100.
Dragerwerk Aktiengesellschaft: *See*—
Bommer, Rainer, 5,004,585, Cl. 422-58.000.
Draghetti, Fiorenzo, to G. D Societa' per Azioni. Method and device for producing tubular wrappings. 5,003,755, Cl. 53-466.000.
Draghi, Enrica: *See*—
Moay, Neomi; and Draghi, Enrica, 5,004,694, Cl. 435-240.270.
Drain-All, Inc.: *See*—
Cummings, Ernie W., 5,004,004, Cl. 137-195.000.
Draper, Kenneth G., to Schering Corporation. Antiviral oligomers. 5,004,810, Cl. 536-27.000.
Dreschel, Jurgen; Hog, Peter; and Mobs, Stephan, to Bell & Howell GmbH. Method and apparatus for changing the direction of sheet conveyance. 5,004,220, Cl. 271-184.000.
Drewnowski, Wojciech S.: *See*—
Hinzmann, Alfred; Shu, Timour T.; Drewnowski, Wojciech S.; and Preisner, Peter M., 5,004,467, Cl. 604-904.000.
Drey, Gilbert: *See*—
Oudet, Claude; Drey, Gilbert; and Veignat, Norbert, 5,003,686, Cl. 29-596.000.
DRG (UK) Limited: *See*—
Tallentire, Alan; and Sinclair, Colin S., 5,004,645, Cl. 428-323.000.
Dron, Donald I.: *See*—
Ashton, Michael J.; Bridge, Andrew W.; Chambers, Robert K.; Dron, Donald I.; Fenton, Garry; Harris, Neil V.; Lythgoe,

David J.; McFarlane, Ian M.; Newton, Christopher G.; Riddell, David; Smith, Christopher; Stuttle, Keith A. J.; and Toft, Malcolm P., 5,004,747, Cl. 514-309.000.
Drucker, Alan S., to Carrier Corporation. Variable area refrigerant expansion device. 5,004,008, Cl. 137-504.000.
Drupp Kautex Maschinenbau GmbH: *See*—
Eiselen, Otto, 5,004,578, Cl. 264-514.000.
Dubois, Edward A.: *See*—
Bassick, John W.; and Dubois, Edward A., 5,003,630, Cl. 2-2.10A.
Dudley, Kenneth W.: *See*—
Bowen, Robert F.; Dudley, Kenneth W.; and Maiellano, Joseph C., Jr., 5,004,617, Cl. 426-233.000.
Dufournet, Francois; and Vernerey, Philippe, to Societe Anonyme Dite: Millet. Adjustable frame for backpack. 5,004,135, Cl. 224-210.000.
Dull, Raymond P.; Lavas, Bernard R.; and Baxter, William D., to Shaw-Walker Company, The. Open office system partition panel assembly. 5,003,740, Cl. 52-239.000.
Dumont, Willy: *See*—
Krief, Alain; and Dumont, Willy, 5,004,840, Cl. 568-486.000.
Duncan, Harold D., to Ford Motor Company. Intake manifold. 5,003,932, Cl. 123-52.0MB.
Duncan, James L.: *See*—
Hafelfinger, Werner; Sholder, Jason A.; King, Murray P.; and Duncan, James L., 5,003,975, Cl. 128-419.0PG.
Dunn, Wendell E., Jr.; Carda, Dan D.; and Storbeck, Timothy A., to Auric-Chlor, Inc. Chlorination process for recovering gold values from gold alloys. 5,004,500, Cl. 75-422.000.
Dunning, Richard E.: *See*—
D'Amato, Salvatore F.; Sorbo, Peter; and Dunning, Richard E., 5,003,915, Cl. 118-46.000.
Dunseath, W. J., Jr., to Technology 21, Inc. Non-polarizable dry biomedical electrode. 5,003,978, Cl. 128-640.000.
Dupillier, Christian, to Dolphin Integration. Telephone interface circuit. 5,005,199, Cl. 379-375.000.
Du Pont de Nemours, E. I., and Company: *See*—
Enquist, Lynn W.; Robbins, Alan K.; and Whealy, Mary E., 5,004,693, Cl. 435-235.100.
Gutierrez, Carlos D., 5,004,212, Cl. 266-170.000.
Hallam, Donald E.; Popper, Peter; Staunton, Harold F.; Taylor, Robert E.; and Yngve, Paul W., 5,003,763, Cl. 57-297.000.
Huynh-Ba, Gia, 5,004,784, Cl. 525-123.000.
Irwin, Robert S., 5,004,834, Cl. 564-142.000.
Kiku, Yutaro, 5,005,106, Cl. 361-424.000.
Paquette, Louis J., 5,004,209, Cl. 251-144.000.
Weaver, Thomas D., 5,004,812, Cl. 546-201.000.
Dupre, Herman K. Method and apparatus for making snow. 5,004,151, Cl. 239-2.200.
Durham, George R.; and Hebert, Randy S., to Dow Chemical Company, The. Process to produce aromatics of low acid-wash color. 5,004,851, Cl. 585-260.000.
Durr, Dieter, to Linde Aktiengesellschaft. Belt conveyor system for a conveyor belt fashioned as a braided web. 5,003,731, Cl. 51-418.000.
Durum Verschleissschutz GmbH: *See*—
Born, Dieter; Knauf, Peter; and Retelsdorf, Hans-Joachim, 5,004,886, Cl. 219-76.140.
Duruz, Jean-Jacques, to Moltech Invent S.A. Refractory oxycompound/refractory hard metal composite and used in molten salt aluminum production cells. 5,004,524, Cl. 204-243.00R.
Duss, Hanspeter, to Grapha-Holding AG. Method of and apparatus for counting flat objects in a stream of partially overlapping objects. 5,005,192, Cl. 377-8.000.
Dutcher, Davy L.; and Secoolish, Ronald H. Fishing lure. 5,003,723, Cl. 43-42.130.
Dyar, Royce M. Flexible outdoor flip sign display. 5,003,716, Cl. 40-503.000.
Dyer, John, to Hoke Incorporated. Geared air actuator. 5,003,864, Cl. 92-132.000.
Dynamic Foam Products, Inc.: *See*—
Daley, Peter A., 5,003,708, Cl. 36-44.000.
Dyroff, David R.; Getman, Daniel P.; and Glascock, Joan K., to Monsanto Company. Sulfone peroxycarboxylic acids. 5,004,558, Cl. 252-95.000.
E.C.H. Will GmbH: *See*—
Brandt, Eckhard, 5,004,094, Cl. 198-460.000.
Deutschle, Robert, 5,004,174, Cl. 242-58.600.
E.G.O. Elektro-Gerate Blanc U. Fischer: *See*—
Goessler, Gerhard; Wilde, Eugen; and Seeburger, Rolf, 5,004,892, Cl. 219-464.000.
E.R. Squibb & Sons: *See*—
Leise, Walter F., Jr., 5,004,464, Cl. 604-338.000.
Eakin, Gary N. Computer activated reward dispensing machine. 5,004,966, Cl. 318-446.000.
Eastman Christensen Company: *See*—
Tibbitts, Gordon A.; and Jones, Mark L., 5,004,057, Cl. 175-408.000.
Eastman Kodak Company: *See*—
Burnham, William L., 5,005,032, Cl. 354-149.110.
Devon, Thomas J.; Phillips, Gerald W.; Puckette, Thomas A.; Stavinoha, Jerome L.; and Vanderbilt, Jeffrey J., 5,004,823, Cl. 556-136.000.
Dey, Thomas W., 5,004,337, Cl. 356-124.000.
Donivan, Lawrence J.; and Laukaitis, Joseph F., 5,005,050, Cl. 355-208.000.
Kelbe, Richard R., 5,005,031, Cl. 354-106.000.
Niedospial, John J., 5,004,176, Cl. 242-71.100.
Pagano, Daniel M., 5,005,035, Cl. 354-206.000.
Tanaka, Yukio, 5,005,058, Cl. 357-17.000.
Wilson, William B.; DiPietro, Matthew; Neace, Richard K.; Dethier, Vincent B.; Hauss, Raymond G.; and Louk, James R., 5,005,036, Cl. 354-322.000.
Eaton Corporation: *See*—
Breen, Michael T.; and Skorupski, Jeffrey H., 5,005,130, Cl. 364-426.010.
Schnut, Robert H., 5,004,873, Cl. 200-83.00P.
Theisen, Peter J.; Wycklendt, Daniel A.; Juds, Mark A.; and Moldovan, Peter K., 5,004,874, Cl. 200-144.00R.
Ebara Corporation: *See*—
Sase, Toshitsugu; Matsuda, Michiaki; Yanagisawa, Kiyoshi; and Maeda, Mitsuru, 5,004,068, Cl. 181-276.000.
Ebrat, Abdol R.: *See*—
Beckman, John A.; Huang, Shu-Jen; and Ebrat, Abdol R., 5,004,550, Cl. 210-710.000.
Echl, Friedrich: *See*—
Schulz, Hans E.; Braas, Jurgen; and Echl, Friedrich, 5,004,415, Cl. 425-297.000.
Edelman, William; Constantinou, Dennis; Stefanovski, Miles; Jan, Yuh L.; Fahlen, Theodore S.; Hansen, Ronald L.; and Kramasz, Kenneth J., to Schneider (USA) Inc. Laser catheter system. 5,005,180, Cl. 372-57.000.
Educational Testing Service: *See*—
Serrell, Robert; Smith, J. Lamar; and Kurst, Frederick L., 5,004,896, Cl. 235-437.000.
Edwards, D. Brandon, to Edwards Optical Corporation. Telemicroscope with at least one light absorbing annular baffle fitting. 5,004,332, Cl. 350-453.000.
Edwards Optical Corporation: *See*—
Edwards, D. Brandon, 5,004,332, Cl. 350-453.000.
Edwards, Stanley A., to United Kingdom Atomic Energy Authority. Optical fiber scanning system for heat sensing. 5,004,922, Cl. 250-340.000.
Eguchi, Ken: *See*—
Nishimura, Yukuo; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Nakagiri, Takashi; Saito, Kenji; Kimura, Toshiaki; Matsuda, Hiroshi; Sakai, Kunihiro; and Miyazaki, Toshihiko, 5,004,671, Cl. 430-286.000.
Ehrenfreund, Josef: *See*—
Dingwall, John G.; Ehrenfreund, Josef; Hall, Roger G.; and Jack, James, 5,004,826, Cl. 558-169.000.
Ehster, Kathryn: *See*—
Carpenter, Dewey; and Ehster, Kathryn, 5,004,099, Cl. 206-83.500.
Eiselen, Otto, to Drupp Kautex Maschinenbau GmbH. Process and apparatus for producing hollow bodies of thermoplastic material. 5,004,578, Cl. 264-514.000.
Eklund, Ante: *See*—
Segerpalm, Hans; and Eklund, Ante, 5,004,304, Cl. 312-201.000.
Elder, Jack E.: *See*—
Rush, William B., II; Elder, Jack E.; Shier, Richard K.; Foss, Jerry B.; Haltiner, Karl J., Jr.; and Wheeler, Grant M., 5,003,933, Cl. 123-52.0MC.
Electric Power Research Institute, Inc.: *See*—
Lee, Sunggyu; Ashok, Sawant; and Kulik, Conrad J., 5,004,717, Cl. 502-50.000.
Electro-Films, Inc.: *See*—
Hjulstrom, Richard A., 5,004,658, Cl. 430-5.000.
Electrolux Water Systems, Inc.: *See*—
Noll, John R.; and Montvila, Stephen V., 5,004,541, Cl. 210-251.000.
Electrophysiology Laboratories of Dallas, Inc.: *See*—
Finitzo, Terese; and Pool, Kenneth D., Jr., 5,003,986, Cl. 128-731.000.
Elenbaas, Tony J.: *See*—
Lanser, Mike L.; and Elenbaàs, Tony J., 5,004,289, Cl. 296-97.120.
Elevage Avicole de la Bohardiere: *See*—
Dambre, Pierre, 5,003,924, Cl. 119-44.000.
Elfaki, Mohamed G.: *See*—
Ragland, William L.; and Elfaki, Mohamed G., 5,004,607, Cl. 424-88.000.
Elkem a/s: *See*—
Aune, Jan A.; and Pedersen, Thor, 5,004,496, Cl. 75-10.280.
Elleaume, Philippe; and Prevost, Michel, to Thomson CSF. Digital computation inegrated circuit for convolution type computations. 5,005,149, Cl. 364-728.010.
Eller, Joe C.; Leavens, James E.; and Wyatt, Charles H., to Enviro-Air Control Corporation. Particulate abatement and environmental control system. 5,004,483, Cl. 55-20.000.
Elliott, Albert O., Jr., to Huff, Richard; and Huuf, Amanda. Tube reaming and deburring device. 5,004,383, Cl. 408-211.000.
Elliott, Donald A.: *See*—
Guruswamy, Vinodhini; and Elliott, Donald A., 5,004,583, Cl. 422-58.000.
Elliott, Michael; Janes, Norman F.; and Pulman, David A., to National Research Development Corporation. Insecticides. 5,004,822, Cl. 556-115.000.
Ellozy, Hamed A.; Jeanty, Henry H.; and Tappert, Charles C., to International Business Machines Corporation. Handwriting recognition employing pairwise discriminant measures. 5,005,205, Cl. 382-3.000.
Elopak A/S: *See*—
Bunce, Kevin R., 5,004,009, Cl. 137-512.300.

El-Sayed, Aziz: *See*—
Zecher, Wilfried; El-Sayed, Aziz; Haese, Wilfried; Kohler, Burkhard; and Meyer, Rolf-Volker, 5,004,795, Cl. 528-73.000.

Eltoukhy, Atef H.: *See*—
Lal, Brij B.; and Eltoukhy, Atef H., 5,004,652, Cl. 428-611.000.

Emerson, John D.: *See*—
Mixon, Larry C.; Snyder, George W.; Hill, Scott D.; Johnson, Gregory L.; Wlodarski, J. Frank; von Spakovsky, Alexis P.; Emerson, John D.; Cole, James M.; and Tipton, John P., 5,003,883, Cl. 102-476.000.

EMI Limited: *See*—
Webb, Brian C.; Pedley, Derek G.; Prosser, Stephen J.; Hijikigawa, Masaya; and Furubayashi, Hisatoshi, 5,004,700, Cl. 437-42.000.

Emitec Gesellschaft fur Emissionstechnologie mbH: *See*—
Swars, Helmut, 5,004,370, Cl. 403-277.000.

Emmerling, Winfried; Wichelhaus, Juergen; and Podola, Tore, to Henkel Kommanditgesellschaft auf Aktien. Isocyanate prepolymers. 5,004,794, Cl. 528-52.000.

Empresa Brasileira De Compressores S/A Embraco: *See*—
Da Costa, Caio M. F. N., 5,004,408, Cl. 418-15.000.
Da Costa, Caio M. F. N., 5,004,410, Cl. 418-63.000.

Engdahl, Gerald E.; and Shah, Tushar K., to Chicago Bridge & Iron Technical Services Company. Apparatus and method of producing an ice slurry at the triple point of a solution. 5,003,784, Cl. 62-124.000.

Engelmann, Jurgen: *See*—
Mucic, Vinko; Thieme, Kurt; and Engelmann, Jurgen, 5,004,043, Cl. 165-118.000.

England, David R., to Rolls-Royce plc. Method and apparatus for electro chemical machining. 5,004,528, Cl. 204-129.200.

England, Eric; and DiSalvo, Rick. Container cover. 5,004,118, Cl. 220-216.000.

Enquist, Lynn W.; Robbins, Alan K.; and Whealy, Mary E., to Du Pont de Nemours, E. I., and Company. Pseudorabies virus recombinants and their use in the production of proteins. 5,004,693, Cl. 435-235.100.

Enscore, David J.: *See*—
Osborne, James L.; Nelson, Melinda; Enscore, David J.; Yum, Su I.; and Gale, Robert M., 5,004,610, Cl. 424-448.000.

Enviro-Air Control Corporation: *See*—
Eller, Joe C.; Leavens, James E.; and Wyatt, Charles H., 5,004,483, Cl. 55-20.000.

Environmental Research Institute of Michigan: *See*—
Vlannes, Nickolas P., 5,004,673, Cl. 430-325.000.

Epple, Gerhard, to BASF Aktiengesellschaft. Preparation of 1-amino-2-bromo-4-hydroxyanthraquinone. 5,004,819, Cl. 552-244.000.

Epstein, Marvin: *See*—
Cummiskey, Peter; Epstein, Marvin; Gilmour, Paul A.; and Kim, Richard, 5,005,168, Cl. 370-24.000.

Erber, Anton; Hoff, Heinz; Reuchlein, Gunter; Schaaf, Hanno; and Schiessl, Gerhard, to Man Technologie Aktiengesellschaft. Stirling engine. 5,003,778, Cl. 60-517.000.

Erichsen, Jonathan T.; Evinger, Craig; and Karten, Harvey J., to Research Foundation of State University of New York, The. Means for detecting and analyzing neuroanatomy. 5,004,683, Cl. 435-7.210.

Erickson, Frederick L.; and Richeson, William E., Jr., to Magnavox Government and Industrial Electronics Company. Pneumatically powered valve actuator. 5,003,938, Cl. 123-90.140.

Eriksson, Mats: *See*—
Ternstrom, Ingela; and Eriksson, Mats, 5,004,465, Cl. 604-385.100.

Ernst, Theodore R., to BMC Software, Inc. Method for optimizing data streams containing two-byte characters. 5,005,137, Cl. 364-514.000.

Eskandry, Ezra D.: *See*—
Farrar, James G.; and Eskandry, Ezra D., 5,005,125, Cl. 364-403.000.

Eskimo Pie Corporation: *See*—
Straight, Jay G.; and Moore, Henry P., 5,004,620, Cl. 426-304.000.

Esser, Klaus; and Hacker, Hans-Eugen, to Herman Wangner GmbH & Co. KG. Separator for seaming machines. 5,003,675, Cl. 28-141.000.

Establissements Proteor: *See*—
Palfray, Michel, 5,004,477, Cl. 623-53.000.

Esys S.A.: *See*—
Boulanger, Alain; and Rousseau, Andre J., 5,004,298, Cl. 299-5.000.

Ethyl Corporation: *See*—
Beaver, Phillip R.; DiGiacinto, Peter M.; Hutchinson, Donald O.; and Vega, Julio J., 5,004,847, Cl. 570-186.000.
Beaver, Phillip R., 5,004,848, Cl. 570-206.000.
Lam, William Y.; and Liesen, Gregory P., 5,004,481, Cl. 44-435.000.
Presswood, J. Kenneth; and O'Quinn, Alethea H., 5,004,627, Cl. 427-133.000.

ETI-TEC Maschinenbau GmbH: *See*—
Zodrow, Rudolf, 5,004,518, Cl. 156-568.000.

Ettlinger, Manfred: *See*—
Deller, Klaus; Ettlinger, Manfred; Klingel, Rainhard; and Krause, Helmfried, 5,004,719, Cl. 502-242.000.

Eurotool B.V.: *See*—
Van Den Brink, Anthonie, 5,004,416, Cl. 425-564.000.

Evans, Ben E.; Bock, Mark G.; and Freidinger, Roger M., to Merck & Co., Inc. Methods of antagonizing CCK or gastrin with benzodiazepine analogs. 5,004,741, Cl. 514-221.000.

Everbrite, Inc.: *See*—
Trame, Charles E.; Karsten, Robert A.; and Hobach, Michael W., 5,003,717, Cl. 40-518.000.

Everts, Robert G., to Inertia Dynamics Corporation. Connector for a convertible blower-vacuum. 5,003,662, Cl. 15-330.000.

Evinger, Craig: *See*—
Erichsen, Jonathan T.; Evinger, Craig; and Karten, Harvey J., 5,004,683, Cl. 435-7.210.

Expert Image Systems, Inc.: *See*—
Lanza, Richard C.; and Votano, Joseph R., 5,005,195, Cl. 378-62.000.
Lanza, Richard C.; and Votano, Joseph R., 5,005,196, Cl. 378-207.000.

Exxon Production Research Company: *See*—
Johnson, Dale V.; and Gordon, John R., 5,004,007, Cl. 137-501.000.
Krohn, Christine E., 5,005,159, Cl. 367-57.000.

Exxon Research and Engineering Company: *See*—
Anderson, Michael P., 5,004,710, Cl. 501-103.000.
Baker, Charles L.; Cody, George D.; Joseph, Craig A.; and Sela, Uri, 5,004,152, Cl. 239-8.000.

Fabius, Albert. Supporting arm. 5,004,203, Cl. 248-285.000.

Fabricus, Claus, to Mator AG. Procedure for the metered addition of copper ions in cheese production. 5,003,869, Cl. 99-453.000.

Fabriques de Tabac Reunies, S.A.: *See*—
Tallier, Bernard; and Hagmann, Otto, 5,003,996, Cl. 131-84.200.

Faccioli, Giovanni; De Bastiani, Basilio M.; Magnan, Bruno; and Soffiatti, Renzo, to Tecres Spa. Two phase cement mixture, particularly suitable for othopaedics. 5,004,501, Cl. 106-35.000.

Fahlen, Theodore S.: *See*—
Edelman, William; Constantinou, Dennis; Stefanovski, Miles; Jan, Yuh L.; Fahlen, Theodore S.; Hansen, Ronald L.; and Kramasz, Kenneth J., 5,005,180, Cl. 372-57.000.

Falempin, Francois, to Office National d'Etudes et de Recherches Aerospatiales. Symmetrical, two dimensional, supersonic and hypersonic air intake for the combustion air of an aircraft engine. 5,004,187, Cl. 244-53.00B.

Falk, Timothy L.; and Rhoads, Geoffrey B., to Tektronix, Inc. Method and apparatus for calibrating a scan convertor. 5,005,145, Cl. 364-571.020.

Fallstrom, Robert D.: *See*—
Hanson, Charles M.; Koester, Vaughn J.; and Fallstrom, Robert D., 5,005,213, Cl. 455-617.000.

Fang, Ho-Tsung. Door of concavity surface. 5,003,745, Cl. 52-316.000.

Fanner, John C.; and Halstead, Nick V., to Onan Corporation. Governor assist mechanism. 5,003,949, Cl. 123-382.000.

Fanuc Ltd.: *See*—
Kanda, Kunio, 5,005,012, Cl. 340-750.000.
Mizuno, Toru; and Hara, Ryuichi, 5,004,968, Cl. 318-615.000.
Nakashima, Yoshihiro; and Kinoshita, Yasunori, 5,005,134, Cl. 364-474.010.
Yamazaki, Etsuo; Iehisa, Nobuaki; and Suzuki, Kazuhiro, 5,004,889, Cl. 219-121.610.

Farmer, David M.: *See*—
Morser, Alfred H.; Gildemeister, Walter M.; and Farmer, David M., 5,005,135, Cl. 364-474.350.

Farrar, James G.; and Eskandry, Ezra D., to Sensormatic Electronics Corporation. Surveillance, pricing and inventory system. 5,005,125, Cl. 364-403.000.

Faucheux, Marc A. F.: *See*—
Grynberg, Gilbert; Pinard, Michel M. E.; and Faucheux, Marc A. F., 5,004,341, Cl. 356-350.000.

Feagin, Roy C., to Remet Corporation. Refractory material. 5,004,039, Cl. 164-361.000.

Feder, Michel; and Frances, Jean-Marc, to Rhone-Poulenc Chimie. Aqueous dispersions of crosslinkable silicones/siliconates. 5,004,771, Cl. 524-161.000.

Fedorovich, George: *See*—
Messenger, Edward J.; and Fedorovich, George, 5,004,248, Cl. 277-37.000.

Feldman, Martin; and Simpson, Princess E., to AT&T Bell Laboratories. Resolution confocal microscope, and device fabrication method using same. 5,004,321, Cl. 350-320.000.

Felgentreu, Peter, to Koh-I-Noor Rapidograph, Inc. Drop-weight and tubular writing instrument. 5,004,365, Cl. 401-258.000.

Felix Schoeller jr. GmbH & Co. KG: *See*—
Dethlefs, Ralf-Burkhard; Scholz, Bernd; Wysk, Wolfram; and Miefert, Elke, 5,004,644, Cl. 428-323.000.

Fenton, Garry: *See*—
Ashton, Michael J.; Bridge, Andrew W.; Chambers, Robert K.; Dron, Donald I.; Fenton, Garry; Harris, Neil V.; Lythgoe, David J.; McFarlane, Ian M.; Newton, Christopher G.; Riddell, David; Smith, Christopher; Stuttle, Keith A. J.; and Toft, Malcolm P., 5,004,747, Cl. 514-309.000.

Ferag AG: *See*—
Meier, Jacques, 5,004,092, Cl. 198-347.300.

Ferrell, Philip J., to Boeing Company, The. Method and apparatus for characterizing a radio transmitter. 5,005,210, Cl. 455-115.000.

Fiatgeotech S.p.A.: *See*—
Barbagli, Rino O.; and De Castelli, Giorgio, 5,004,060, Cl. 180-6.440.

Fiers, Walter C.; and Allet, Bernard, to Biogen, Massachusetts. DNA sequences, recombinant DNA molecules and processes for producing gamma interferon-like polypeptides in high yields. 5,004,689, Cl. 435-69.510.

Filatov, Alexei V.: *See*—
Goikhman, Yakov A.; Krjukov, Georgy M.; Onotsky, Melis I.; Sorokin, Georgy M.; Filatov, Alexei V.; Tsarapkin, Viktor V.; Yakimov, Vadim P.; Smirnov, Gennady A.; Nikiforov, Ivan I.; Burdukovsky, Alexandr I.; Daibov, Sergei V.; and Kurdjukov, Alexandr S., 5,004,056, Cl. 175-293.000.

Fine, Daniel H.: *See*—
Stefaniak, Philip S.; and Fine, Daniel H., 5,004,124, Cl. 222-136.000.

Finitzo, Terese; and Pool, Kenneth D., Jr., to Pool, Kenneth D., Jr.; and Electrophysiology Laboratories of Dallas, Inc., a part interest. Hie-

rarchial analysis for processing brain stem signals to define a prominent wave. 5,003,986, Cl. 128-731.000.

Fischer, Addison M. Public key/signature cryptosystem with enhanced digital signature certification. 5,005,200, Cl. 380-30.000.

Fischer, Robert D., to Gas Research Institute. Gas engine driven heat pump system. 5,003,788, Cl. 62-238.700.

Fisher, Gene A., to Unique Mobility, Inc. Lightweight high power electromagnetic transducer. 5,004,944, Cl. 310-266.000.

Fisher, Gordon: *See—*
Bernards, Roger F.; Fisher, Gordon; and Sonnenberg, Wade, 5,004,525, Cl. 204-52.100.

Fitzpatrick, Mark E.; and Burd, Robert C., to Gazelle Microcircuits, Inc. Floating transistor switch. 5,004,971, Cl. 323-312.000.

Fjeld, Svein: *See—*
Rosendahl, Finn; Fjeld, Svein; Salama, Mamdouh M.; and Gillen, Michael P., 5,004,051, Cl. 166-357.000.

Fleiter, Lothar: *See—*
Blum, Harald; Meixner, Jurgen; Schreckenberg, Manfred; Fleiter, Lothar; and Wellner, Wolfgang, 5,004,779, Cl. 524-591.000.

Flora, David D.: *See—*
Legler, John G.; Folkerth, Harold E.; Flora, David D.; and Hile, Barry L., 5,004,027, Cl. 144-136.00R.

Fluoroware, Inc.: *See—*
Linder, James C.; and McKenzie, Jeffrey J., 5,004,011, Cl. 137-556.000.

Flutec Fluidtechnische Gerate GmbH: *See—*
Jung, Rudiger, 5,004,006, Cl. 137-501.000.

Focke & Co., (GmbH & Co.): *See—*
Focke, Heinz, 5,004,396, Cl. 414-417.000.

Focke, Heinz, to Focke & Co., (GmbH & Co.). Apparatus for the feeding of (pack) blanks to a packaging machine. 5,004,396, Cl. 414-417.000.

Fodera, Frank. Method of making a stone veneer panel. 5,004,512, Cl. 156-153.000.

Folkerth, Harold E.: *See—*
Legler, John G.; Folkerth, Harold E.; Flora, David D.; and Hile, Barry L., 5,004,027, Cl. 144-136.00R.

Fong, Dodd W.; and Kowalski, David J., to Nalco Chemical Company. Process for producing sulfomethylamide polymers. 5,004,786, Cl. 525-344.000.

Fonsny, Pierre: *See—*
Julemont, Michel; Zocchi, Germaine; Mineo, Nunzio; and Fonsny, Pierre, 5,004,556, Cl. 252-99.000.

Fonss, Jack G.; Silverberg, Howard Z.; and Gardiner, Martin H., to Arrow Marine, Inc. Automatic motor synchronizer. 5,004,962, Cl. 318-85.000.

Foot, John, to Paccar Inc. Vehicle nose pivotal hinge assembly. 5,004,062, Cl. 180-69.210.

Ford, Mark R.: *See—*
Schmidt, Robert J.; Haizmann, Robert S.; Ford, Mark R.; Low, C. David; and Adams, Frank H., 5,004,859, Cl. 585-741.000.

Ford, Mary A.: *See—*
Ford, Theodore H.; and Ford, Mary A., 5,003,973, Cl. 128-201.250.

Ford Motor Company: *See—*
Boaz, Premakaran T., 5,004,284, Cl. 294-118.000.
Brown, Franklin I., 5,004,490, Cl. 60-60.520.
Duncan, Harold D., 5,003,932, Cl. 123-52.0MB.
Oslapas, Algis; and Rumpel, Manfred, 5,004,063, Cl. 180-79.100.
Stinar, Robert P.; Calvas, George T.; and McNamara, David A., 5,003,801, Cl. 70-278.000.

Ford, Theodore H.; and Ford, Mary A. Rescue helmet apparatus. 5,003,973, Cl. 128-201.250.

Forestier, Serge: *See—*
Richard, Herve; Leduc, Madeleine; Forestier, Serge; and Lang, Gerard, 5,004,594, Cl. 424-47.000.

Fornara, Dario: *See—*
Bastioli, Catia; Garlisi, Salvatore; Fornara, Dario; and Bellotti, Vittorio, 5,004,817, Cl. 549-557.000.

Fortier, Richard C.: *See—*
Kleven, Lawrence P.; Agranat, Edward A.; Crisafulli, Jerry; Robinson, Hugh; Smith, David J.; Wiseley, Thomas; Fortier, Richard C.; Johnson, Severne; and Menzin, Marvin, 5,004,954, Cl. 315-106.000.

Fortin, J. Andre ; Ogilvie, Kelvin K.; Tsantrizos, Youla S.; and Kope, Harry H., to Universite Laval. Biofungicidal composition. 5,004,754, Cl. 514-570.000.

Forum Chemicals Ltd.: *See—*
Staniforth, John N., 5,004,614, Cl. 424-466.000.

Foseco International Limited: *See—*
Wahl, Hans-Peter; Schlueter, Rudolf; Kaettlitz, Wolfgang; and Loos, Rolf, 5,004,545, Cl. 210-510.100.

Foss, Jerry B.: *See—*
Rush, William B., II; Elder, Jack E.; Shier, Richard K.; Foss, Jerry B.; Haltiner, Karl J., Jr.; and Wheeler, Grant M., 5,003,933, Cl. 123-52.0MC.

Fouque, Romain: *See—*
Maurice, Jacques; Fouque, Romain; and Auriol, Jean-Louis, 5,004,591, Cl. 423-578.00R.

Foux, Amnon: *See—*
Beyar, Mordechay; and Foux, Amnon, 5,004,454, Cl. 600-30.000.

Fowles, Arthur D. Cordless electric fishing reel. 5,004,181, Cl. 242-225.000.

Foxboro Company, The: *See—*
Kalinoski, Richard W.; Chitty, Gordon W.; and Vignos, James H., 5,003,827, Cl. 73-861.240.

Frances, Jean-Marc: *See—*
Feder, Michel; and Frances, Jean-Marc, 5,004,771, Cl. 524-161.000.

Francis Rollier SA: *See—*
Gremaud, Henri; Gremaud, Martial; and Rollier, Michel, 5,004,930, Cl. 250-561.000.

Francois, Pierre-Michel: *See—*
Boinot, Francois; Cousin, Michel; Francois, Pierre-Michel; and Michel-Dansac, Francois, 5,004,789, Cl. 525-506.000.

Frankhouser, Paul L.: *See—*
Botterbusch, Carl N.; and Frankhouser, Paul L., 5,004,456, Cl. 604-53.000.

Franks, Lawrence A.: *See—*
Milliman, James G.; and Franks, Lawrence A., 5,003,691, Cl. 29-727.000.

Franz, Karl-Heinz; Ochs, Heinrich; and Difflipp, Kurt, to MAN Roland Druckmaschinen AG. Inking unit for a rotary offset printing machine. 5,003,871, Cl. 101-148.000.

Franzen, Hans U.: *See—*
Pleschiutschnigg, Fritz-Peter; Parschat, Lothar; Franzen, Hans U.; Pfluger, Manfred; and Glaser, Josef, 5,004,040, Cl. 164-453.000.

Freadman, Tommyca. Packaging arrangement for transporting audio system components to and from an outdoor marine site. 5,004,105, Cl. 206-576.000.

Freed, William J.: *See—*
Wyatt, Richard J.; Freed, William J.; and Staub, Richard A., 5,004,457, Cl. 604-158.000.

Freed, William T.: *See—*
Hallden-Abberton, Michael P.; Bortnick, Newman M.; Cohen, Leslie A.; Freed, William T.; and Fromuth, Harry C., 5,004,777, Cl. 524-433.000.

Frehaut, Jean-Pierre; and Pineau, Jean-Pierre, to Thomson-Brandt Armements. Device for tilting a sub-munition under a parachute into inclined position. 5,003,882, Cl. 102-387.000.

Freidinger, Roger M.: *See—*
Evans, Ben E.; Bock, Mark G.; and Freidinger, Roger M., 5,004,741, Cl. 514-221.000.

Fresenius A. G.: *See—*
Terness, Peter; and Opelz, Gerhard, 5,004,604, Cl. 424-85.500.

Frimel, Jody W.: *See—*
Nagarajan, Madukkarai K.; Wherley, Fred J.; and Frimel, Jody W., 5,004,557, Cl. 252-174.240.

Frincke, James M.; Bartholomew, Richard M.; and Dillman, Robert O., to Hybritech Incorporated. Non-covalent antibody-anthracycline immunocomplexes. 5,004,606, Cl. 424-85.800.

Fritz, Hans-Gerhard; and Loffel, Rudi, to Hoechst Aktiengesellschaft. Method and apparatus for detecting in conformity with process time mixing ratios in plastics and rubber compounding. 5,005,194, Cl. 378-53.000.

Fritz, Walter: *See—*
Petzold, Rainer; Fritz, Walter; and Wiencek, Norbert, 5,004,086, Cl. 192-85.00C.

Fromuth, Harry C.: *See—*
Hallden-Abberton, Michael P.; Bortnick, Newman M.; Cohen, Leslie A.; Freed, William T.; and Fromuth, Harry C., 5,004,777, Cl. 524-433.000.

Fronk, David M.; Brookstein, David S.; and Skelton, John, to Baxter International Inc. Prosthetic anterior cruciate ligament design. 5,004,474, Cl. 623-13.000.

Fudono, Kanji; Ogawa, Hiroshi; Takahashi, Toshimasa; and Yamashita, Toshio, to Mitsubishi Jukogyo Kabushiki Kaisha. Refrigerating apparatus. 5,003,786, Cl. 62-156.000.

Fuji Electrochemical Co. Ltd.: *See—*
Matsuo, Yoshio; Nakano, Hirofumi; Kamiya, Masakuni; and Matsui, Kezuo, 5,004,580, Cl. 419-65.000.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Abe, Kunihiro; Sakamoto, Masanori; and Kobayashi, Tomoya, 5,005,129, Cl. 364-424.030.
Furuyama, Masaaki, 5,003,816, Cl. 73-117.300.
Ide, Tohru, 5,004,450, Cl. 474-242.000.
Tezuka, Kazunari; and Fujiki, Haruo, 5,004,064, Cl. 180-197.000.

Fuji Photo Film Co., Ltd.: *See—*
Adachi, Keiichi; Katoh, Kazunobu; and Kawamura, Kouichi, 5,004,674, Cl. 430-333.000.
Arai, Fuminori; and Kondo, Asaji, 5,004,685, Cl. 435-25.000.
Ishikawa, Akira; and Harada, Kazumasa, 5,003,751, Cl. 53-215.000.
Kondo, Syunichi; and Watarai, Syu, 5,004,641, Cl. 428-208.000.
Mifune, Hiroyuki; and Urabe, Shigeharu, 5,004,679, Cl. 430-567.000.
Miyata, Yukihide; Ishizaka, Hideo; Saito, Yoshio; and Koizumi, Takashi, 5,004,582, Cl. 422-56.000.
Namiki, Tomizo; Suzuki, Tamotsu; and Katayama, Masashi, 5,004,668, Cl. 430-256.000.
Okutsu, Eiichi; Hirano, Mitsunori; and Yagihara, Morio, 5,004,670, Cl. 430-265.000.
Seto, Nobuo; and Morigaki, Masakazu, 5,004,678, Cl. 430-548.000.
Shimizu, Kunimasa; Shigyo, Masao; and Tanaka, Hiroshi, 5,004,917, Cl. 250-236.000.
Takasaki, Yoshimi; and Horikawa, Kazuo, 5,004,906, Cl. 250-214.00A.
Terai, Fumitaka; Yukawa, Kimio; Suyefuji, Mineo; Saito, Hiroki; and Yamaguchi, Shigeru, 5,004,628, Cl. 427-389.900.
Ueda, Shinji, 5,004,677, Cl. 430-382.000.
Yoneyama, Hiroyuki; Takahashi, Osamu; Yoshida, Kazuaki; and Ishikawa, Takatoshi, 5,004,675, Cl. 430-377.000.

Fuji Xerox Co., Ltd.: *See—*
Dobashi, Kenji, 5,004,222, Cl. 271-225.000.

Sakata, Yasushi; and Iwamori, Toshimichi, 5,005,067, Cl. 357-54.000.
Fujii, Akira: *See*—
Fujino, Akihiko; Inoue, Manabu; Omaki, Takanobu; Nakai, Masaaki; Fujii, Akira; and Sekida, Minoru, 5,005,047, Cl. 354-442.000.
Tomita, Masahiro; Hayashi, Satoshi; Oda, Shinro; Fujii, Akira; and Tanigawa, Masayoshi, 5,004,945, Cl. 310-328.000.
Fujii, Hiroyuki: *See*—
Tanahashi, Masaaki; Hagiwara, Hiroyuki; and Fujii, Hiroyuki, 5,004,172, Cl. 242-54.00R.
Fujii, Takeshi: *See*—
Mashita, Kentaro; Fujii, Takeshi; and Oomae, Tadayuki, 5,004,782, Cl. 525-64.000.
Fujiki, Haruo: *See*—
Tezuka, Kazunari; and Fujiki, Haruo, 5,004,064, Cl. 180-197.000.
Fujimura, Yasuo; and Fujiwara, Toshio, to Sumitsu & Company, Limited. Paper cutter. 5,003,856, Cl. 83-576.000.
Fujino, Akihiko; Inoue, Manabu; Omaki, Takanobu; Nakai, Masaaki; Fujii, Akira; and Sekida, Minoru, to Minolta Camera Kabushiki Kaisha. Camera data setting device. 5,005,047, Cl. 354-442.000.
Fujino, Ikuo: *See*—
Kuribara, Motoaki; and Fujino, Ikuo, 5,004,090, Cl. 192-112.000.
Fujino, Nobutsugu: *See*—
Aono, Yoshihito; Iwamatsu, Takanori; Minowa, Morihiko; Takenaka, Sadao; Daidoh, Yoshimasa; Nakamura, Hiroshi; and Fujino, Nobutsugu, 5,005,186, Cl. 375-82.000.
Fujisawa, Eiichi: *See*—
Yoneyama, Syuichi; Obana, Yoshinori; and Fujisawa, Eiichi, 5,003,958, Cl. 123-635.000.
Fujita, Shigeru; Tanaka, Hideo; and Harada, Susumu, to Toshiba Kikai Kabushiki Kaisha. Apparatus for displaying a profile and corresponding data of operating conditions. 5,005,116, Cl. 364-188.000.
Fujitsu Limited: *See*—
Aono, Yoshihito; Iwamatsu, Takanori; Minowa, Morihiko; Takenaka, Sadao; Daidoh, Yoshimasa; Nakamura, Hiroshi; and Fujino, Nobutsugu, 5,005,186, Cl. 375-82.000.
Hashimoto, Koichi, 5,005,046, Cl. 355-77.000.
Kakinoki, Yoshikazu; Nakashima, Masato; Koezuka, Tetsuo; Hiraoka, Noriyuki; Tsukahara, Hiroyuki; Suto, Yoshinori; Oshima, Yoshitaka; and Hashinami, Shinji, 5,004,929, Cl. 250-561.000.
Kawamoto, Masakazu, 5,005,172, Cl. 371-18.000.
Nakagawa, Kenji, 5,004,927, Cl. 250-492.200.
Takahashi, Yasushi; and Yasuda, Hiroshi, 5,004,925, Cl. 250-491.100.
Fujiwara, Toshio: *See*—
Fujimura, Yasuo; and Fujiwara, Toshio, 5,003,856, Cl. 83-576.000.
Fukada, Tetsuji; Wakamiya, Masayuki; and Kainou, Kikuo, to Matsushita Electric Industrial Co., Ltd. Vibration/acceleration sensor. 5,003,824, Cl. 73-651.000.
Fukase, Hiroshi: *See*—
Horii, Satoshi; and Fukase, Hiroshi, 5,004,838, Cl. 568-347.000.
Fukuchi, Hiroyuki, to Kirin Beer Kabushiki Kaisha. Method and apparatus for inspecting sidewalls of bottles using stripe pattern illumination. 5,004,909, Cl. 250-223.00B.
Fukuda Densky Co, Ltd.: *See*—
Muraki, Yoshiya; and Koike, Hiroyuki, 5,003,984, Cl. 128-710.000.
Fukuhara, Akihiko: *See*—
Kenmochi, Kazuhito; Yarita, Ikuo; Fukuhara, Akihiko; Komatu, Tomio; and Kishida, Akira, 5,003,804, Cl. 72-39.000.
Fukuhara, Hiroshige: *See*—
Kato, Koichiro; Fukuhara, Hiroshige; Kamishima, Hiroyuki; and Tsukahara, Hitoshi, 5,005,021, Cl. 343-717.000.
Fukui, Tetsuro: *See*—
Arahara, Kozo; Fukui, Tetsuro; Fukumoto, Hiroshi; Katayama, Masato; and Takasu, Yoshio, 5,004,667, Cl. 430-255.000.
Fukumochi, Yoji: *See*—
Kugimiya, Shuzo; Fukumochi, Yoji; Nakamura, Ichiko; Hirai, Tokuyuki; and Suzuki, Hitoshi, 5,005,127, Cl. 364-419.000.
Fukumoto, Hiroshi: *See*—
Arahara, Kozo; Fukui, Tetsuro; Fukumoto, Hiroshi; Katayama, Masato; and Takasu, Yoshio, 5,004,667, Cl. 430-255.000.
Fukushima, Nobuo; Sakai, Shinji; Takdea, Osamu; Takei, Masahiro; Suzuki, Yasutomo; Okino, Tadashi; and Jinnai, Shigeru, to Canon Kabushiki Kaisha. Recording and/or reproducing apparatus adapted to minimize electrical energy consumption. 5,005,088, Cl. 360-69.000.
Fukushima, Toru; Takabayashi, Tsunehisa; and Ogai, Mikio, to Furukawa Electric Company, Ltd., The. Semiconductor device. 5,005,179, Cl. 372-46.000.
Fuller, Timothy J.; Marchessault, Robert H.; and Bluhm, Terry L., to Xerox Corporation. Toner and developer compositions containing biodegradable semicrystalline polyesters. 5,004,664, Cl. 430-106.600.
Funaki, Keisuke: *See*—
Yamasaki, Komei; and Funaki, Keisuke, 5,004,649, Cl. 428-461.000.
Fung, Paul: *See*—
Wislinski, Martin; Bergquist, Roger; Schroeder, Manfred; Weir, Theodore; Monetti, Matthew; and Fung, Paul, 5,004,579, Cl. 264-517.000.
Furubayashi, Hisatoshi: *See*—
Webb, Brian C.; Pedley, Derek G.; Prosser, Stephen J.; Hijikigawa, Masaya; and Furubayashi, Hisatoshi, 5,004,700, Cl. 437-42.000.
Furukawa Electric Company, Ltd., The: *See*—
Fukushima, Toru; Takabayashi, Tsunehisa; and Ogai, Mikio, 5,005,179, Cl. 372-46.000.
Miyazaki, Hiroshi, 5,004,315, Cl. 350-96.150.
Furukawa, Kazunari, to Yamaha Corporation. Acoustic apparatus. 5,004,066, Cl. 181-160.000.
Furuno Electric Co., Ltd.: *See*—
Oshima, Hisaichi; and Yamashita, Masami, 5,005,027, Cl. 346-76.0PH.
Furuta, Kouichi, to Sharp Kabushiki Kaisha. Semiconductor integrated circuit and test method for characteristics. 5,004,934, Cl. 307-303.000.
Furuya, Takashi: *See*—
Sakakibara, Shiro; and Furuya, Takashi, 5,004,082, Cl. 192-3.260.
Furuya, Takeo: *See*—
Kobayashi, Kyoji; and Furuya, Takeo, 5,004,178, Cl. 242-107.000.
Furuya, Yhuzi: *See*—
Haruki, Shinichi; Furuya, Yhuzi; and Tsujita, Akio, 5,005,051, Cl. 355-221.000.
Furuyama, Masaaki, to Fuji Jukogyo Kabushiki Kaisha. Engine idling control apparatus. 5,003,816, Cl. 73-117.300.
Fuse, Masashi, to Alps Electric Co., Ltd. Transmitting radiation through a flexible printed circuit to an optical fiber bundle. 5,005,029, Cl. 346-107.00R.
Fushiya, Fusao; Yokoyama, Yoshio; and Hara, Akihito, to Makita Electric Works, Ltd. Electrically-operated tacker. 5,004,140, Cl. 227-8.000.
G. D Societa' per Azioni: *See*—
Draghetti, Fiorenzo, 5,003,755, Cl. 53-466.000.
G & S Metal Products Company, Inc.: *See*—
Nottingham, John R.; Spirk, John W., Jr.; and Brokaw, Paul E., 5,004,882, Cl. 219-10.55E.
Gabas, Carlos, to Industrias Techno-Matic S.A. Automobile sun visor with built-in air freshener box. 5,004,138, Cl. 224-312.000.
Gacs, Peter T.: *See*—
Donnelly, Peter; and Gacs, Peter T., 5,004,188, Cl. 244-137.002.
Gadberry, Michael D.: *See*—
Robb, Stephen P.; Phipps, John P.; and Gadberry, Michael D., 5,005,061, Cl. 357-23.130.
Gagneux, Georges, to Valeo Systemes d'Essuyage. Brush holder device for an electric motor having a rotatable commutator. 5,004,943, Cl. 310-239.000.
Gaiser, William R.: *See*—
Bartley, Harold D.; and Gaiser, William R., 5,004,109, Cl. 215-1.00C.
Gajda, Gregory J., to UOP. Butene isomerization process. 5,004,858, Cl. 585-667.000.
Gale, Robert M.: *See*—
Osborne, James L.; Nelson, Melinda; Enscore, David J.; Yum, Su I.; and Gale, Robert M., 5,004,610, Cl. 424-448.000.
Galinis, Paul J.: *See*—
Cooke, Kevin K.; Dewitt, John R.; Galinis, Paul J.; and Koteff, Walter B., 5,004,866, Cl. 174-35.0GC.
Gallagher, James C.; and Gallagher, Michael K. Method and apparatus for negative charge effect and separation of undesirable gases. 5,005,101, Cl. 361-231.000.
Gallagher, Michael K.: *See*—
Gallagher, James C.; and Gallagher, Michael K., 5,005,101, Cl. 361-231.000.
Gandy, Raymond C.: *See*—
Atkins, Kenneth E.; Gentry, Robert R.; and Gandy, Raymond C., 5,004,765, Cl. 523-434.000.
Gaona, Manuel; and Gaona, Stephen M. Mist air conditioner for evaporative cooler. 5,003,789, Cl. 62-304.000.
Gaona, Stephen M.: *See*—
Gaona, Manuel; and Gaona, Stephen M., 5,003,789, Cl. 62-304.000.
Garces, Juan M.: *See*—
Lee, Guo-shuh J.; Garces, Juan M.; Maj, Joseph J.; and Rocke, Stephen C., 5,004,841, Cl. 568-678.000.
Gardiner Communications Corporation: *See*—
Harris, James M., 5,005,023, Cl. 343-756.000.
Gardiner, Martin H.: *See*—
Fonss, Jack G.; Silverberg, Howard Z.; and Gardiner, Martin H., 5,004,962, Cl. 318-85.000.
Gardner Asphalt Corporation: *See*—
Grzybowski, Kenneth F.; and Anthony, Brian J., 5,004,772, Cl. 524-62.000.
Garlati, Rodolfo: *See*—
Palmieri, Beniamino; and Garlati, Rodolfo, 5,004,469, Cl. 606-139.000.
Garlisi, Salvatore: *See*—
Bastioli, Catia; Garlisi, Salvatore; Fornara, Dario; and Bellotti, Vittorio, 5,004,817, Cl. 549-557.000.
Garlock Inc.: *See*—
Messenger, Edward J.; and Fedorovich, George, 5,004,248, Cl. 277-37.000.
Garman, Charles L.: *See*—
Pugliese, Joseph S.; and Garman, Charles L., 5,004,514, Cl. 156-251.000.
Garner, William C. Saw table apparatus. 5,004,029, Cl. 144-287.000.
Gas Research Institute: *See*—
Fischer, Robert D., 5,003,788, Cl. 62-238.700.
Gaslonde, Jean-Pierre: *See*—
Grave, Georges A.; and Gaslonde, Jean-Pierre, 5,005,207, Cl. 388-816.000.
Gates Rubber Company, The: *See*—
Bemis, Steve; and Stocker, Erwin E., 5,004,513, Cl. 156-191.000.
Gauthier, Jacques Y.: *See*—
Young, Robert N.; Zamboni, Robert; and Gauthier, Jacques Y., 5,004,743, Cl. 514-227.800.

Gavrilenko, Tamara P.: *See—*
Ulyanitsky, Vladimir J.; Gavrilenko, Tamara P.; Nikolaev, Jury A.; and Buteev, Alexandr I., 5,004,021, Cl. 141-67.000.

Gazelle Microcircuits, Inc.: *See—*
Fitzpatrick, Mark E.; and Burd, Robert C., 5,004,971, Cl. 323-312.000.

Gebr. Happich GmbH: *See—*
Viertel, Lothar; Kaiser, Peter; and Welter, Patrick, 5,004,288, Cl. 296-97.110.

GEC Mechanical Handling Limited: *See—*
Donneky, Peter; and Gacs, Peter T., 5,004,188, Cl. 244-137.002.

Geiger, Jon R.: *See—*
Roberts, Katherine P.; Geiger, Jon R.; and Carney, Jayne F., 5,004,682, Cl. 435-6.000.

Geisler, Edward. Water reclamation apparatus. 5,004,536, Cl. 210-136.000.

General Electric Company: *See—*
Dehn, Rudolph A.; and Macdonald, Andrew J., 5,005,015, Cl. 340-962.000.
Piccone, Dante E.; McIntyre, James E., deceased; and Major, Leroy B., 5,005,065, Cl. 357-38.000.
Rumbaugh, James E.; and Daniel, Kenneth J., 5,005,119, Cl. 364-200.000.
Sawyer, Thomas F., 5,004,153, Cl. 239-81.000.
Seymour, Raymond K.; Hart, Marshall B.; Magnon, Gary D.; von Kannewurff, Michael C.; and Doughty, Dennis J., 5,004,878, Cl. 200-144.00R.
Stocking, George E.; Stich, Richard A.; Besore, John K.; and Denham, Clarence W., 5,004,302, Cl. 312-214.000.
Svec, Paul S.; Borom, Marcus P.; Szala, Lawrence E.; Brun, Milivoj K.; Miller, Steven A.; and Mourer, David P., 5,004,629, Cl. 427-204.000.
Thompson, Robert A., 5,003,805, Cl. 72-53.000.
Zdepski, Joel W.; and Koslov, Joshua L., 5,005,082, Cl. 358-174.000.

General Electric Company, p.l.c., The: *See—*
Robins, Michael P.; and Roberts, Malcolm T., 5,005,128, Cl. 364-424.020.

General Motors Corporation: *See—*
Miller, Gregory A.; Pearson, Jeffery L.; and Horsch, John D., 5,004,266, Cl. 280-743.000.
Rush, William B., II; Elder, Jack E.; Shier, Richard K.; Foss, Jerry B.; Haltiner, Karl J., Jr.; and Wheeler, Grant M., 5,003,933, Cl. 123-52.0MC.
Stettner, Ernest R.; and Stoltman, Donald D., 5,004,162, Cl. 239-585.000.
Ward, Robert W., 5,004,577, Cl. 264-112.000.

Genetech, Inc.: *See—*
Light, David R.; and Rastetter, William H., 5,004,690, Cl. 435-138.000.

Genetics Institute, Inc.: *See—*
Kaufman, Randal J.; and Pittman, Debra, 5,004,803, Cl. 530-383.000.

Gentry, Robert R.: *See—*
Atkins, Kenneth E.; Gentry, Robert R.; and Gandy, Raymond C., 5,004,765, Cl. 523-434.000.

Gentry, Ted L.: *See—*
Shannon, Leland K.; Gentry, Ted L.; and Le, Toby, 5,003,811, Cl. 73-12.000.

Geo-Centers, Inc.: *See—*
Schnur, Joel M.; Rudolph, Alan S.; and Testoff, Mary A., 5,004,566, Cl. 260-403.000.

Georg Fischer AG: *See—*
Gut, Karl; Matejka, Wolfgang A.; Gysel, Walter; and Gerber, Urs, 5,003,880, Cl. 102-314.000.

Geostock S.A.R.L.: *See—*
Boulanger, Alain; and Rousseau, Andre J., 5,004,298, Cl. 299-5.000.

Gerber, Urs: *See—*
Gut, Karl; Matejka, Wolfgang A.; Gysel, Walter; and Gerber, Urs, 5,003,880, Cl. 102-314.000.

Getman, Daniel P.: *See—*
Dyroff, David R.; Getman, Daniel P.; and Glascock, Joan K., 5,004,558, Cl. 252-95.000.

Ghandehari, Mohammad H., to Union Oil Company of California. Rare earth-iron-boron compositions for polymer-bonded magnets. 5,004,499, Cl. 75-254.000.

Giaramita, Michael. Color dental kit and method of use. 5,004,417, Cl. 433-26.000.

Gibbons, Ian: *See—*
Hillman, Robert S.; Cobb, Michael E.; Allen, Jimmy D.; Gibbons, Ian; Ostoich, Vladimir E.; and Winfrey, Laura J., 5,004,923, Cl. 250-341.000.

Giddey, Claude; and Dove, Georges, to Battelle Memorial Institute. Aqueous foaming composition and method for homogenizingly incorporating water into lipophilic materials. 5,004,623, Cl. 426-564.000.

Gildemeister, Walter M.: *See—*
Morser, Alfred H.; Gildemeister, Walter M.; and Farmer, David M., 5,005,135, Cl. 364-474.350.

Giles, Clinton R.: *See—*
Desurvire, Emmanuel; Giles, Clinton R.; Simpson, Jay R.; and Zyskind, John L., 5,005,175, Cl. 372-6.000.

Gillard, Clive H., to Sony Corporation. Motion dependent video signal processing. 5,005,078, Cl. 358-140.000.

Gillard, Clive H.: *See—*
Samad, Raphael; and Gillard, Clive H., 5,005,077, Cl. 358-140.000.

Gillen, Michael P.: *See—*
Rosendahl, Finn; Fjeld, Svein; Salama, Mamdouh M.; and Gillen, Michael P., 5,004,051, Cl. 166-357.000.

Gillespie, Peter J.: *See—*
Wasmer, William D.; Gillespie, Peter J.; Lippmann, James G.; and Le, Hiep M., 5,005,069, Cl. 357-72.000.

Gilmour, Paul A.: *See—*
Cummiskey, Peter; Epstein, Marvin; Gilmour, Paul A.; and Kim, Richard, 5,005,168, Cl. 370-24.000.

Gimeno, Carlos V. Non-reusable syringe. 5,004,460, Cl. 604-228.000.

Giordano, Claudio: *See—*
Castaldi, Graziano; and Giordano, Claudio, 5,004,832, Cl. 562-490.000.

Girard, Philippe: *See—*
Antoine, Michel; Barreau, Michel; Desconclois, Jean-Francois; Girard, Philippe; and Picaut, Guy, 5,004,745, Cl. 514-254.000.

Gisoni, Gregory A.: *See—*
Lipchak, John B.; Oblak, Tod A.; Bednar, Fred H.; Ciaramitaro, William; Hughes, Francis R.; Smith, John R.; and Gisoni, Gregory A., 5,005,142, Cl. 364-550.000.

Glascock, Joan K.: *See—*
Dyroff, David R.; Getman, Daniel P.; and Glascock, Joan K., 5,004,558, Cl. 252-95.000.

Glasener, Ted W.: *See—*
Hartmann, Jon P.; and Glasener, Ted W., 5,004,999, Cl. 340-539.000.

Glaser, Josef: *See—*
Pleschiutschnigg, Fritz-Peter; Parschat, Lothar; Franzen, Hans U.; Pfluger, Manfred; and Glaser, Josef, 5,004,040, Cl. 164-453.000.

Glass, Alastair M.; Knox, Wayne H.; and Nolte, David D., to AT&T Bell Laboratories. Optical processing using a multilayer heterostructure. 5,004,325, Cl. 350-354.000.

Glasstech, Inc.: *See—*
McMaster, Ronald A.; and Shetterly, Donivan M., 5,004,491, Cl. 65-106.000.

Glatt, Jack E.: *See—*
Strobl, Frederick P., Jr.; and Glatt, Jack E., 5,003,733, Cl. 52-86.000.

Gleason, John R.: *See—*
Johnston, Norman J.; St. Clair, Terry L.; Baucom, Robert M.; and Gleason, John R., 5,004,575, Cl. 264-136.000.

Gleim, Guunter, to Deutsche Thomson-Brandt GmbH. Circuitry for generating phase-shifted sinusoidal voltages. 5,005,114, Cl. 363-43.000.

Glick, J. Leslie, to Bionix Corporation. Methods for diagnosing, monitoring and controlling the onset and progression of certain dementias and impeding memory loss or improving impairment of memory. 5,004,615, Cl. 424-692.000.

Glinecke, Robert: *See—*
Radebaugh, Galen W.; Murtha, John L.; and Glinecke, Robert, 5,004,613, Cl. 424-465.000.

Globe-Union Inc.: *See—*
Symanski, James S., 5,004,655, Cl. 429-82.000.

Glunz, Wolfgang; and Rau, Gunnar, to MAN Roland Druckmaschinen AG. Rotary printing machine system with a web path changing arrangement. 5,003,889, Cl. 101-228.000.

Gobel, Richard: *See—*
Adams, James; Gobel, Richard; and Lanham, Bryan, 5,004,028, Cl. 144-176.000.

Godlewski, Edward S. Up-feed conveyor system. 5,004,219, Cl. 271-116.000.

Goessler, Gerhard; Wilde, Eugen; and Seeburger, Rolf, to E.G.O. Elektro-Gerate Blanc U. Fischer. Radiant element. 5,004,892, Cl. 219-464.000.

Gohda, Eiichi; Tsubouchi, Hirohito; Nakayama, Hiroyuki; Hirono, Shuichi; Takahashi, Kozo; Hashimoto, Shuji; and Daikuhara, Yasushi, to Hashimoto, Shuji; Daikuhara, Yasushi; Gohda, Eiichi; Tsubouchi, Hirohito; and Mitsubishi Kasei Corporation. Hepatocyte growth factor. 5,004,805, Cl. 530-399.000.

Goikhman, Yakov A.; Krjukov, Georgy M.; Onotsky, Melis I.; Sorokin, Georgy M.; Filatov, Alexei V.; Tsarapkin, Viktor V.; Yakimov, Vadim P.; Smirnov, Gennady A.; Nikiforov, Ivan I.; Burdukovsky, Alexandr I.; Daibov, Sergei V.; and Kurdjukov, Alexandr S. Percussion-rotary drilling tool. 5,004,056, Cl. 175-293.000.

Goldburt, Efim S.; and Hemmer, Richard E., to North American Philips Corporation. Solid state light modulator incorporating metallized gel and method of metallization. 5,004,625, Cl. 427-38.000.

Goldowsky, Michael P. Balanced radial engine. 5,003,935, Cl. 123-55.00R.

Goldstar Co., Ltd.: *See—*
Ahn, Chang S., 5,004,360, Cl. 400-144.200.
Lee, Min Ki, 5,004,881, Cl. 219-10.770.

Goldstein, David, to United States of America, Navy. Geothermal energy conversion system. 5,003,779, Cl. 60-527.000.

Golio, John M.; and Staudinger, Joseph, to Motorola, Inc. Digital-to-analog converting field effect device and circuitry. 5,005,059, Cl. 357-22.000.

Gonczy, Stephen T.: *See—*
Stranford, Gerald T.; Gonczy, Stephen T.; and Mitsche, Roy T., 5,004,709, Cl. 501-97.000.

Gonzalez, Fernando, to Micron Technology, Inc. Stacked cell design for 16-megabit DRAM array having a pair of interconnected poly layers which enfold a single field plate layer and connect to the cell's storage node junction. 5,005,072, Cl. 357-23.600.

Goodman, Matthew S.: *See*—
Arthurs, Edward; Goodman, Matthew S.; Kim, Chong K.; and Lee, Tony T., 5,005,167, Cl. 370-4.000.
Goodwin, Jon D.; and Musil, Joseph E., to Cedarapids, Inc. Vehicle positioning methods and apparatus with impact damper. 5,004,394, Cl. 414-346.000.
Gordon, John R.: *See*—
Johnson, Dale V.; and Gordon, John R., 5,004,007, Cl. 137-501.000.
Gorgenyi, Imre: *See*—
Taraci, Richard; Taraci, Brian; and Gorgenyi, Imre, 5,004,973, Cl. 324-158.00R.
Gorovenko, Georgy G.: *See*—
Sizonenko, Olga N.; Maxutov, Rafkhat A.; Maljushevsky, Pavel P.; Gorovenko, Georgy G.; Sokolov, Alexei V.; Lyapis, Diana N.; Schekin, Vladimir I.; and Kuskova, Natalya I., 5,004,050, Cl. 166-248.000.
Goss, George R.: *See*—
Brooks, David D.; Brophy, Shirley A.; and Goss, George R., 5,004,570, Cl. 260-427.000.
Goss, Raymond W., to Hercules Incorporated. Fabric lamination of unitary backed hot constructed carpet tile. 5,004,638, Cl. 428-95.000.
Gossard, William H.: *See*—
Bronder, Joseph B.; and Gossard, William H., 5,005,169, Cl. 370-76.000.
Goto, Hiroshi: *See*—
Toyoshi, Naoki; Oka, Tateki; and Goto, Hiroshi, 5,003,917, Cl. 118-653.000.
Goto, Nobutaka: *See*—
Koboshi, Shigeharu; Kobayashi, Kazuhiro; Goto, Nobutaka; Kurematsu, Masayuki; and Takabayashi, Naoki, 5,004,522, Cl. 159-47.003.
Gotoh, Masaki: *See*—
Ishikawa, Hiroshi; Hasegawa, Kazuo; and Gotoh, Masaki, 5,004,898, Cl. 235-475.000.
Gotou, Yukifumi: *See*—
Narikiyo, Hidetoshi; Gotou, Yukifumi; and Chuma, Yoshihiro, 5,004,149, Cl. 236-49.300.
Goud, Gilles R., to Salomon S.A. Ski brake. 5,004,065, Cl. 280-605.000.
Goulding, Frederick S.: *See*—
Loo, Billy W.; and Goulding, Frederick S., 5,003,980, Cl. 128-653.00R.
Goupil, Robert. Adaptor to convert a bottle fed water cooler into a device supplied with pressurized water from the local piping system. 5,003,790, Cl. 62-389.000.
Graco Inc.: *See*—
Donley, Paul J., 5,003,916, Cl. 118-429.000.
Graf, Felix; and Busenhart, Peter, to Maschinenfabrik Rieter AG. Apparatus for compensating sag of the mandrel of a winding machine. 5,004,170, Cl. 242-18.00R.
Grage, Ludger; and Dato, Paul, to Siemens Aktiengesellschaft. FLIR system with two optical channels for observing a wide and a narrow field of view. 5,005,083, Cl. 358-181.000.
Graham, Anne C.: *See*—
Monte, Charles; White, Paul J.; and Graham, Anne C., 5,003,859, Cl. 84-423.00R.
Graillat, Gerard: *See*—
Provence, Marc; and Graillat, Gerard, 5,004,262, Cl. 280-615.000.
Grapha-Holding AG: *See*—
Duss, Hanspeter, 5,005,192, Cl. 377-8.000.
Grave, Georges A.; and Gaslonde, Jean-Pierre, to U.S. Philips Corporation. Method of controlling the speed of a D.C. motor and device for carrying out the method. 5,005,207, Cl. 388-816.000.
Graves, John G. Combination valve. 5,004,005, Cl. 137-269.500.
Gray, Charles H., Jr. Fire control valve with pivotal latch. 5,004,003, Cl. 137-75.000.
Gray, Richard: *See*—
Atkinson, Anthony; Gray, Richard; and Denes, Oscar L., 5,003,693, Cl. 29-849.000.
Grdzelishvili, Georgy J.: *See*—
Loladze, Teimuraz N.; Batiashvili, Boris I.; Mamulashvili, Gennady L.; Butskhrikidze, David S.; Grdzelishvili, Georgy J.; and Markevich, Jury I., 5,003,728, Cl. 51-165.800.
Great Plains Industries, Inc.: *See*—
Beaston, Brook J., 5,004,013, Cl. 137-614.050.
Green, John M.: *See*—
Perryman, James D.; and Green, John M., 5,005,099, Cl. 360-132.000.
Green, Robert: *See*—
Benstock, Gerald M.; Belkin, Nathan L.; and Green, Robert, 5,003,902, Cl. 112-418.000.
Greenlee, Mark L.: *See*—
DiNinno, Frank P.; Greenlee, Mark L.; and Salzmann, Thomas N., 5,004,739, Cl. 514-210.000.
Dininno, Frank P.; Salzmann, Thomas N.; and Greenlee, Mark L., 5,004,740, Cl. 514-210.000.
Greenwald, Brian D.: *See*—
Parsons, Gerald J.; Greenwald, Brian D.; McGrath, John J.; and Andrasko, Stephen W., 5,005,197, Cl. 379-21.000.
Greenwood, Eugene C.; and Hyatt, John. Infection-resistant catheter. 5,004,455, Cl. 604-43.000.
Gremaud, Henri; Gremaud, Martial; and Rollier, Michel, to Francis Rollier SA. Method and device for setting the angular position of a workpiece on a machine-tool by means of a laser beam. 5,004,930, Cl. 250-561.000.
Gremaud, Martial: *See*—
Gremaud, Henri; Gremaud, Martial; and Rollier, Michel, 5,004,930, Cl. 250-561.000.
Greve, Christopher G.: *See*—
Lapeyre, James M.; Weber, Peter G.; and Greve, Christopher G., 5,004,095, Cl. 198-660.000.
Lapeyre, James M.; Weber, Peter G.; and Greve, Christopher G., 5,004,096, Cl. 198-666.000.
Grey, Bettie. Method of laying out a pathway for piping. 5,004,374, Cl. 405-154.000.
Griebling, Stephen T., to Bridgestone/Firestone, Inc. Contoured liner for preassembled tire components. 5,004,635, Cl. 428-33.000.
Grieco, Steven E.; and Morris, Douglas A., to Motorola, Inc. Multiresonator ceramic filter and method for tuning and adjusting the resonators thereof. 5,004,992, Cl. 333-202.000.
Griffin, David; Campbell, Jonathan; Reilly, Michael; and Rosenbaum, Richard, to Digital Equipment Corporation. Arrangement with cooperating management server node and network service node. 5,005,122, Cl. 364-200.000.
Griffis, Steven C. Method and means for laundering contaminated clothing. 5,003,794, Cl. 68-3.00R.
Grimm, Duane H., to Sundstrand Corporation. Automatic lubrication device for mechanical actuation systems. 5,004,073, Cl. 184-6.120.
Grinwald, Paul M. Method and apparatus for enhanced drug permeation of skin. 5,003,987, Cl. 128-734.000.
Grodek, Raymond J., to Harshaw/Filtrol Partnership. Process of producing colloidal zirconia sols and powders using an ion exchange resin. 5,004,711, Cl. 501-103.000.
Grosch, Peter; Haas, Gerhard; and Kremer, Ingo, to Reinz-Dichtungs-Gesellschaft mbH. Flat gasket and process for its production. 5,004,249, Cl. 277-207.00R.
Gross, Clifford, to Biomechanics Corporation of America. Keyboard accessory. 5,004,196, Cl. 248-118.300.
Grossi, Benedetto: *See*—
Bullard, James R.; Muller, Richard P.; Grossi, Benedetto; and Cristine, John, 5,003,963, Cl. 128-11.000.
Grossler, Peter: *See*—
Nissl, Norbert; and Grossler, Peter, 5,003,884, Cl. 102-476.000.
Grossman, Robert B.: *See*—
Buchwald, Stephen L.; and Grossman, Robert B., 5,004,820, Cl. 556-53.000.
Grote & Hartmann GmbH & Co. KG: *See*—
Neumann, Andreas; and Wiese, Michael, 5,004,101, Cl. 206-343.000.
Gruedelbach, Hans-Dieter: *See*—
Hinzpeter, Juergen; and Gruedelbach, Hans-Dieter, 5,004,576, Cl. 264-40.500.
Grunert, Kurt A.; Pabon, Delfin; and Cheski, Ronald A., to Westinghouse Electric Corp. Clip-connected terminal conductor assembly. 5,005,104, Cl. 361-355.000.
Grunfeld, Hay; Lotan, Noah; and Sideman, Samuel, to Technion Research & Development Foundation Ltd. Method and apparatus for bioaffinity separation. 5,004,547, Cl. 210-635.000.
Grynberg, Gilbert; Pinard, Michel M. E.; and Faucheux, Marc A. F., to Quantel, S.A. Active optical gyrometer employing a phase conjugation. 5,004,341, Cl. 356-350.000.
Grzybowski, Kenneth F.; and Anthony, Brian J., to Gardner Asphalt Corporation. Asphalt roofing compositions especially adapted for cold applications. 5,004,772, Cl. 524-62.000.
GTE Government Systems Corporation: *See*—
Blaisdell, Leonard L., 5,005,022, Cl. 343-753.000.
Guay, Christopher B.: *See*—
Majeti, Satyanarayana; Guay, Christopher B.; and Crisanti, Mark M., 5,004,597, Cl. 424-52.000.
Gubernick, Franklin L.: *See*—
Monticup, Anthony, Jr.; and Gubernick, Franklin L., 5,004,023, Cl. 141-208.000.
Gubon, Peter; Sudmanns, Hans; and Teetz, Christoph, to MTU Friedrichshafen GmbH. Hood covering the space between cylinder banks of an internal-combustion engine which are arranged in a V-shape. 5,003,934, Cl. 123-52.0MV.
Gudel, Claude: *See*—
Cattaneo, Pierr; and Gudel, Claude, 5,004,974, Cl. 324-117.00R.
Guenthner, Waldemar G.: *See*—
Lipscomb, Dennis E.; Wilhelm, Gary L.; Perna, Barbara G.; and Guenthner, Waldemar G., 5,003,695, Cl. 30-193.000.
Guillon, Jean C.: *See*—
Rufray, Jean C.; and Guillon, Jean C., 5,005,073, Cl. 358-21.00R.
Guirguis, Raouf A., to La Mina Ltd. Modular multiple fluid sample preparation assembly. 5,003,988, Cl. 128-771.000.
Guniocke Co., The: *See*—
Sorensen, Thomas V., 5,004,371, Cl. 403-327.000.
Gunzler, Volkmar: *See*—
Baader, Ekkehard; Bickel, Martin; Brocks, Dietrich; Gunzler, Volkmar; Henke, Stephan; and Hanauske-Abel, Hartmut, 5,004,748, Cl. 514-350.000.
Guong-Hong, Li. Device and method for collecting bee venom by attracting and electrocuting injurious bees. 5,004,446, Cl. 449-1.000.
Gupta, Balaram, to Hoechst Celanese Corp. Radiation curable compositions based on 4-acetoxystyrene and 4-hydroxystyrene homopolymers. 5,004,762, Cl. 522-121.000.
Guruswamy, Vinodhini; and Elliott, Donald A., to MedTest Systems, Inc. Universal sensor cartridge for use with a universal analyzer for sensing components in a multicomponent fluid. 5,004,583, Cl. 422-58.000.

Gut, Karl; Matejka, Wolfgang A.; Gysel, Walter; and Gerber, Urs, to Georg Fischer AG. Process for the impact healing of inner discontinuities or defects in the sub-surface region of a cast component. 5,003,880, Cl. 102-314.000.

Gutierrez, Carlos D., to Du Pont de Nemours, E. I., and Company. Apparatus with improved flow-through characteristics for the recovery of silver from silver-containing waste fluids. 5,004,212, Cl. 266-170.000.

Gysel, Walter: *See*—
Gut, Karl; Matejka, Wolfgang A.; Gysel, Walter; and Gerber, Urs, 5,003,880, Cl. 102-314.000.

H-C Industries, Inc.: *See*—
McBride, Stephen W., 5,004,112, Cl. 215-252.000.

Ha, Byung J.: *See*—
Kim, Young D.; and Ha, Byung J., 5,004,737, Cl. 514-182.000.

Haas, Gerhard: *See*—
Grosch, Peter; Haas, Gerhard; and Kremer, Ingo, 5,004,249, Cl. 277-207.00R.

Haas, Oscar W.; Prasad, Ravi; and Smolarek, James, to Union Carbide Corporation. Production of dry, high purity nitrogen. 5,004,482, Cl. 55-16.000.

Habu, Takeshi: *See*—
Yamada, Taketoshi; Habu, Takeshi; and Takamuki, Yasuhiko, 5,004,669, Cl. 430-264.000.

Hacker, Hans-Eugen: *See*—
Esser, Klaus; and Hacker, Hans-Eugen, 5,003,675, Cl. 28-141.000.

Hackett, Charles M., Jr. Detection of digital signals received from multipath channels. 5,005,189, Cl. 375-101.000.

Haese, Wilfried: *See*—
Zecher, Wilfried; El-Sayed, Aziz; Haese, Wilfried; Kohler, Burkhard; and Meyer, Rolf-Volker, 5,004,795, Cl. 528-73.000.

Hafele KG: *See*—
Walz, Rudiger, 5,004,200, Cl. 248-250.000.

Hafelfinger, Werner; Sholder, Jason A.; King, Murray P.; and Duncan, James L., to Siemens-Pacesetter, Inc. Automatic electrode configuration of an implantable pacemaker. 5,003,975, Cl. 128-419.0PG.

Hafner, Paul: *See*—
Schiel, Christian; and Hafner, Paul, 5,003,863, Cl. 92-61.000.

Haga, Katsumi: *See*—
Arai, Tatsuo; and Haga, Katsumi, 5,004,378, Cl. 407-106.000.

Hagan, John: *See*—
Walter, Gerard S.; and Hagan, John, 5,004,437, Cl. 439-811.000.

Hageniers, Omer L.: *See*—
Pryor, Timothy R.; Hageniers, Omer L.; Pastorius, Walter J.; Liptay-Wagner, Nicholas; and Clarke, Donald A., 5,004,339, Cl. 356-241.000.

Hagiwara, Hiroyuki: *See*—
Tanahashi, Masaaki; Hagiwara, Hiroyuki; and Fujii, Hiroyuki, 5,004,172, Cl. 242-54.00R.

Hagmann, Otto: *See*—
Tallier, Bernard; and Hagmann, Otto, 5,003,996, Cl. 131-84.200.

Hagus, U.S.A., Inc.: *See*—
Storm, Manfred; and Storm, Greg J., 5,004,139, Cl. 224-324.000.

Haid, David A.: *See*—
Litz, Lawrence M.; Weise, Mark K.; and Haid, David A., 5,004,571, Cl. 261-91.000.

Haines & Emerson, Inc.: *See*—
Dornblaser, Norman E.; and Hildermann, David F., 5,003,753, Cl. 53-415.000.

Haizmann, Robert S.: *See*—
Schmidt, Robert J.; Haizmann, Robert S.; Ford, Mark R.; Low, C. David; and Adams, Frank H., 5,004,859, Cl. 585-741.000.

Hakotani, Yasuhiko; Nakatani, Seiichi; Yuuhaku, Satoru; Nishimura, Tsutomu; and Ishida, Toru, to Matsushita Electric Industrial Co., Ltd. Dielectric ceramic composition and a multilayer ceramic capacitor and a method of manufacturing a multilayer ceramic capacitor. 5,004,715, Cl. 501-136.000.

Hale, John M., to Orbisphere Corporation. Amperometric cell. 5,004,532, Cl. 204-415.000.

Halem, Stephen; and Lichtman, Philip R. Fluid dispensing and mixing device. 5,004,158, Cl. 239-310.000.

Hall, Randolph L.; and Johnson, Christopher D., to Rockwell International Corporation. Rugate reflector. 5,004,308, Cl. 350-1.700.

Hall, Roger G.: *See*—
Dingwall, John G.; Ehrenfreund, Josef; Hall, Roger G.; and Jack, James, 5,004,826, Cl. 558-169.000.

Hallam, Donald E.; Popper, Peter; Staunton, Harold F.; Taylor, Robert E.; and Yngve, Paul W., to Du Pont de Nemours, E. I., and Company. Apparatus and process for forming alternate twist plied yarn and product therefrom. 5,003,763, Cl. 57-297.000.

Hallden-Abberton, Michael P.; Bortnick, Newman M.; Cohen, Leslie A.; Freed, William T.; and Fromuth, Harry C., to Rohm and Haas Company. Imide polymers. 5,004,777, Cl. 524-433.000.

Halliburton Company: *See*—
Handke, Wayne A., 5,004,400, Cl. 414-786.000.

Halperin, Henry R., to Johns Hopkins University. Dynamic indentation system. 5,003,982. Cl. 128-695.000.

Halperin, Rachel. Hand held safety siren. 5,005,002, Cl. 340-574.000.

Halstead, Nick V.: *See*—
Fanner, John C.; and Halstead, Nick V., 5,003,949, Cl. 123-382.000.

Haltiner, Karl J., Jr.: *See*—
Rush, William B., II; Elder, Jack E.; Shier, Richard K.; Foss, Jerry B.; Haltiner, Karl J., Jr.; and Wheeler, Grant M., 5,003,933, Cl. 123-52.0MC.

Halvorsen, James V., to Bryant Grinder Corporation. Radius dressing apparatus. 5,003,730, Cl. 51-325.000.

Hamada, Kenichi: *See*—
Iwamoto, Koji; Hamada, Kenichi; and Hirota, Katsuaki, 5,005,086, Cl. 358-227.000.
Yano, Tadashi; and Hamada, Kenichi, 5,003,877, Cl. 101-363.000.

Hamada, Masataka; Ishida, Tokuji; and Ishibashi, Kenji, to Minolta Camera Kabushiki Kaisha. Autofocusing camera. 5,005,039, Cl. 354-402.000.

Hamada, Masataka: *See*—
Norita, Toshio; Ishida, Tokuji; Hamada, Masataka; and Ishibashi, Kenji, 5,005,040, Cl. 354-402.000.

Hamana, Takanori: *See*—
Aramaki, Minoru; Suenaga, Takashi; Sakaguchi, Hiroaki; and Hamana, Takanori, 5,004,829, Cl. 562-113.000.

Hamilton, Douglas D.: *See*—
MacLennan, Charles; Hamilton, Douglas D.; and Palfy, Robert M., 5,004,026, Cl. 144-3.00D.

Hamilton Standard Controls, Inc.: *See*—
Mierzwinski, Eugene P., 5,005,123, Cl. 364-400.000.

Hamlin, Humphrey A. S.; and Harral, Michael W., to Normalair-Garrett (Holdings) Ltd. Molecular sieve-type gas separation systems. 5,004,485, Cl. 55-160.000.

Hammerly, Jeffrey L.; and Rosenthal, David S. Model rocket car. 5,004,441, Cl. 446-211.000.

Hammond, John R. M.: *See*—
Simpson, William J.; and Hammond, John R. M., 5,004,684, Cl. 435-8.000.

Hampton, Hilary J.: *See*—
Taylor, Charles S.; and Hampton, Hilary J., 5,003,989, Cl. 128-772.000.

Hampton, Jeanne M.: *See*—
Hampton, William B., 5,003,697, Cl. 33-244.000.

Hampton, William B., to Hampton, William B.; and Hampton, Jeanne M. Telescopic sight lens protector. 5,003,697, Cl. 33-244.000.

Han, Scott: *See*—
DeCaul, Lorenzo C.; Han, Scott; Palermo, Robert E.; and Walsh, Dennis E., 5,004,856, Cl. 585-500.000.

Han, Sil. Master gear turning assembly. 5,003,702, Cl. 33-501.190.

Hanagan, Joseph J., to Thermos Company, Inc., The. Electronic grill control. 5,003,960, Cl. 126-39.0BA.

Hanai, Satoshi: *See*—
Shimamura, Keizo; Amano, Kagetaka; Aisaka, Tatsuryoshi; Hanai, Satoshi; and Nagata, Kohsoku, 5,004,498, Cl. 75-233.000.

Hanatani, Yasuyuki: *See*—
Mutoh, Nariaki; Hanatani, Yasuyuki; and Nishiguchi, Toshihiko, 5,004,662, Cl. 430-59.000.

Hanauske-Abel, Hartmut: *See*—
Baader, Ekkehard; Bickel, Martin; Brocks, Dietrich; Gunzler, Volkmar; Henke, Stephan; and Hanauske-Abel, Hartmut, 5,004,748, Cl. 514-350.000.

Handke, Wayne A., to Halliburton Company. Automatic rate matching system. 5,004,400, Cl. 414-786.000.

Handler, Isidore. Side supported cable tray. 5,004,192, Cl. 248-49.000.

Hane, Toshioki; and Katayama, Shigeki, to Asahi Kasei Kogyo Kabushiki Kaisha. Fiber of a fluorocarbon polymer and a process for producing the same. 5,004,648, Cl. 428-364.000.

Hanes, Ronnie M.; and Kwiatek, Jack, to National Distillers and Chemical Corporation. Carbonylation of allylic ethers to esters. 5,004,568, Cl. 260-410.000.

Hanley, Roger T., to Stanley Works, The. Push to close latch for self-cleaning oven. 5,004,276, Cl. 292-126.000.

Hannecart, Etienne: *See*—
Simoens, Anthony; and Hannecart, Etienne, 5,004,773, Cl. 524-178.000.

Hans, Paul C.; and Rosenfield, Gary C., to Aerotech, Inc. Finlock alignment mechanism for rockets. 5,004,186, Cl. 244-3.250.

Hansard, Gregory R. Rotary vaned valves. 5,003,942, Cl. 123-190.00A.

Hansen, John S.; and Waranius, William A., to Amoco Corporation. Filter system. 5,004,860, Cl. 585-812.000.

Hansen, Lee E.: *See*—
Burchette, Herbert L.; Hansen, Lee E.; West, James C.; and Nawrocki, Glen A., 5,004,402, Cl. 415-137.000.

Hansen, Ronald L.: *See*—
Edelman, William; Constantinou, Dennis; Stefanovski, Miles; Jan, Yuh L.; Fahlen, Theodore S.; Hansen, Ronald L.; and Kramasz, Kenneth J., 5,005,180, Cl. 372-57.000.

Hanson, Charles M.; Koester, Vaughn J.; and Fallstrom, Robert D., to Varo, Inc. Head mounted video display and remote camera system. 5,005,213, Cl. 455-617.000.

Hantos, Gabor: *See*—
Jekkel nee Bokany, Antonia; Albrecht, Karoly; Ambrus, Gabor; Lang, Tibor; Szabo, Istvan M.; Ilkoy, Eva; Konczol, Kalman; Moravcsik, Imre; Hantos, Gabor; Simonovits, Emilia; Lengyel nee Szemenyei, Zsuzsanna; Vida, Zsuzesanna; and Csajagi, Eva, 5,004,695, Cl. 435-253.100.

Hara, Akihito: *See*—
Fushiya, Fusao; Yokoyama, Yoshio; and Hara, Akihito, 5,004,140, Cl. 227-8.000.

Hara, Kazumasa; Sano, Yasuro; Koike, Mikio; and Nishijima, Mitsuru, to Janome Sewing Machine Co. Ltd. Device for guiding a lower thread in a sewing machine. 5,003,896, Cl. 112-121.110.

Hara, Ryuichi: *See*—
Mizuno, Toru; and Hara, Ryuichi, 5,004,968, Cl. 318-615.000.

Hara, Yasuhiro; Inoue, Mitsuhiro; Baba, Hideo; Okazaki, Tadashi; and Kudo, Shigeru, to Hitachi Chemical Company, Ltd. Clutch driven plates and method of producing the same. 5,004,089, Cl. 192-107.00M.

Harada, Kazumasa: *See*—
Ishikawa, Akira; and Harada, Kazumasa, 5,003,751, Cl. 53-215.000.
Harada, Shoichi: *See*—
Imai, Hajime; Kito, Shozo; Harada, Shoichi; Yokoyama, Yoshinobu; Nakamura, Syuzi; Miyoshi, Shigetoshi; and Muramatsu, Tadao, 5,003,799, Cl. 70-247.000.
Harada, Susumu: *See*—
Fujita, Shigeru; Tanaka, Hideo; and Harada, Susumu, 5,005,116, Cl. 364-188.000.
Haraguchi, Hiroshi; Tamura, Hiroshi; Kodama, Katuhiko; and Kondo, Toshio, to Nippondenso Co., Ltd. Method of controlling air-fuel ratio. 5,003,955, Cl. 123-489.000.
Harandi, Mohsen N., to Mobil Oil Corp. Two-stage process for conversion of olefins to high octane gasoline. 5,004,852, Cl. 585-322.000.
Hariri, Farouk A., to Texas Instruments Incorporated. Radiation heat shield for silicon melt-in manufacturing of single crystal silicon. 5,004,519, Cl. 156-620.400.
Harke, Alfons, to International Intec Patent Holding Establishment. Grouting anchor to be inserted in a predrilled hole. 5,003,749, Cl. 52-703.000.
Harkins, James J. Screwdriver with holding sleeve. 5,003,850, Cl. 81-436.000.
Harlow Chemical Company Limited: *See*—
Mahil, Mahinder S.; and Cruden, John M., 5,004,768, Cl. 524-30.000.
Harnish, Daniel F.; Pickens, Donald; and Zweig, Andrew M., to Allied-Signal Inc. Fluorinated surfactant monomers for polymer surface modification. 5,004,790, Cl. 526-242.000.
Harper, Homer C.: *See*—
Cocherell, Francis E.; Harper, Homer C.; and Hsieh, George, 5,004,596, Cl. 424-52.000.
Harral, Michael W.: *See*—
Hamlin, Humphrey A. S.; and Harral, Michael W., 5,004,485, Cl. 55-160.000.
Harris, Halford S. Retractable cleat device. 5,004,388, Cl. 410-107.000.
Harris, James M., to Gardiner Communications Corporation. Dual band integrated LNB feedhorn system. 5,005,023, Cl. 343-756.000.
Harris, James P.: *See*—
Roy, James P.; and Harris, James P., 5,003,845, Cl. 81-3.400.
Harris, Neil V.: *See*—
Ashton, Michael J.; Bridge, Andrew W.; Chambers, Robert K.; Dron, Donald I.; Fenton, Garry; Harris, Neil V.; Lythgoe, David J.; McFarlane, Ian M.; Newton, Christopher G.; Riddell, David; Smith, Christopher; Stuttle, Keith A. J.; and Toft, Malcolm P., 5,004,747, Cl. 514-309.000.
Harris, Norman: *See*—
Bradley, Michael W.; Harris, Norman; and Turner, Keith, 5,004,845, Cl. 568-885.000.
Harrison, Daniel R.: *See*—
Mallard, Bobby J.; Knapp, Richard H.; Roper, W. J.; and Harrison, Daniel R., 5,004,071, Cl. 182-3.000.
Harrison, John R.; and Millard, Michael W., to Ward Machinery Company, The. Printing apparatus with dual inking system. 5,003,876, Cl. 101-350.000.
Harshaw/Filtrol Partnership: *See*—
Grodek, Raymond J., 5,004,711, Cl. 501-103.000.
Hart, Marshall B.: *See*—
Seymour, Raymond K.; Hart, Marshall B.; Magnon, Gary D.; von Kannewurff, Michael C.; and Doughty, Dennis J., 5,004,878, Cl. 200-144.00R.
Hartman, Standish C.: *See*—
Lockhart, John C., Jr.; Hartman, Standish C.; Meuron, Bruce R.; and Lyons, Joseph B., Jr., 5,004,185, Cl. 224-3.140.
Hartmann, Jon P.; and Glasener, Ted W., to Honeywell, Inc. Extended RF range alarm system. 5,004,999, Cl. 340-539.000.
Haruki, Shinichi; Furuya, Yhuzi; and Tsujita, Akio, to Hitachi Koki Co., Ltd. Electrophotographic image recording apparatus using amorphous silicon hydride photosensitive drum. 5,005,051, Cl. 355-221.000.
Harwood, Jon W.: *See*—
Van Blaircum, Bennie A.; Harwood, Jon W.; and Kimmet, Mark S., 5,004,069, Cl. 181-282.000.
Hasegawa, Kazuo: *See*—
Ishikawa, Hiroshi; Hasegawa, Kazuo; and Gotoh, Masaki, 5,004,898, Cl. 235-475.000.
Hasegawa, Kimio: *See*—
Yamamoto, Yohzoh; Ishiwata, Shuichi; Yokoyama, Kenji; and Hasegawa, Kimio, 5,004,764, Cl. 523-400.000.
Haseler, Helmut: *See*—
Meckl, Heinz; Klotzer, Sieghart; Wolff, Erich; and Haseler, Helmut, 5,004,676, Cl. 430-398.000.
Haseltine, Eric C.; and Jones, Helene H., to Hughes Aircraft Company. Catadioptric projector, catadioptric projection system and process. 5,004,331, Cl. 350-443.000.
Hasenberg, Thomas C.: *See*—
Lam, Juan F.; and Hasenberg, Thomas C., 5,005,176, Cl. 372-10.000.
Hashimoto, Koichi, to Fujitsu Limited. Pattern forming method. 5,005,046, Cl. 355-77.000.
Hashimoto, Shuji: *See*—
Gohda, Eiichi; Tsubouchi, Hirohito; Nakayama, Hiroyuki; Hirono, Shuichi; Takahashi, Kozo; Hashimoto, Shuji; and Daikuhara, Yasushi, 5,004,805, Cl. 530-399.000.
Hashimoto, Takayoshi: *See*—
Kawada, Sunao; Hashimoto, Takayoshi; Itoh, Toyotsugu; and Koyanagi, Makoto, 5,003,851, Cl. 82-1.110.
Hashimoto, Toru; Takabatake, Masato; Chino, Masashi; and Takahashi, Akira, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Detector device for simultaneously detecting both the direction and number of rotations of rotating member. 5,004,981, Cl. 324-207.220.
Hashinami, Shinji: *See*—
Kakinoki, Yoshikazu; Nakashima, Masato; Koezuka, Tetsuo; Hiraoka, Noriyuki; Tsukahara, Hiroyuki; Suto, Yoshinori; Oshima, Yoshitaka; and Hashinami, Shinji, 5,004,929, Cl. 250-561.000.
Haskin, Marvin E., to Prevail, Inc. System and method for remote presentation of diagnostic image in formation. 5,005,126, Cl. 364-413.130.
Hasler, Rudolf, to U.S. Philips Corp. Oscillator for controlling a mixer stage in a tuner. 5,004,989, Cl. 331-117.00R.
Hatano, Ako: *See*—
Izumiya, Toshihide; Ohba, Yasuo; and Hatano, Ako, 5,005,057, Cl. 357-17.000.
Hatta, Katuhiro; Hiramatsu, Takeo; and Takamiya, Bonnosuke, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Control device for automatic transmission gear system. 5,003,842, Cl. 74-867.000.
Hatta, Shinji: *See*—
Takayama, Syuichi; Tsukaya, Takashi; Ueda, Yasuhiro; Hatta, Shinji; and Abe, Masashi, 5,003,991, Cl. 128-784.000.
Hattori, Jun: *See*—
Suzuki, Masayuki; and Hattori, Jun, 5,004,328, Cl. 350-416.000.
Hauni Richmond, Inc.: *See*—
Hinzmann, Alfred; Shu, Timour T.; Drewnowski, Wojciech S.; and Preisner, Peter M., 5,004,467, Cl. 604-904.000.
Hauss, Raymond G.: *See*—
Wilson, William B.; DiPietro, Matthew; Neace, Richard K.; Dethier, Vincent B.; Hauss, Raymond G.; and Louk, James R., 5,005,036, Cl. 354-322.000.
Havriluk, Rod, to Swimming Technology Research, Inc. Method and apparatus for monitoring hydrodynamic therapy and exercise. 5,005,140, Cl. 364-550.000.
Hawkins, Robert E.: *See*—
D'Ottavio, Eugene D.; Hawkins, Robert E.; Rodriguez, Stephen S.; and Rychwalski, James, 5,004,672, Cl. 430-314.000.
Hay, Robert A.; Willkens, Craig A.; and Arsenault, Normand P., to Norton Company. Reaction bonded silicon nitride filtration membranes. 5,004,544, Cl. 210-490.000.
Hay, Wayne R., to Systron Donner Corporation. Accelerometer based power control apparatus for aircraft subsystem. 5,004,963, Cl. 320-13.000.
Hayasaka, Hiroshi; and Nagata, Akio, to Hitachi Koko Company, Limited. Centrifuge. 5,004,453, Cl. 494-39.000.
Hayashi, Chihiro: *See*—
Nakasuji, Kazuyuki; and Hayashi, Chihiro, 5,004,143, Cl. 228-126.000.
Hayashi, Koji: *See*—
Yokoe, Masaaki; Kurono, Yoshikazu; and Hayashi, Koji, 5,003,897, Cl. 112-121.120.
Hayashi, Minoru; Kobari, Koichi; Sato, Kimiharu; and Kishimoto, Junichi, to Nippon Koki Co., Ltd. Gas generating apparatus for inflating air bag. 5,004,586, Cl. 422-164.000.
Hayashi, Satoshi: *See*—
Tomita, Masahiro; Hayashi, Satoshi; Oda, Shinro; Fujii, Akira; and Tanigawa, Masayoshi, 5,004,945, Cl. 310-328.000.
Hayashi, Shigeru; and Yamada, Kaneo, to Shiseido Company Ltd. Fibrinophilic urokinase complex. 5,004,609, Cl. 424-94.300.
Hayden, Theodore R. Vacuum system attachment. 5,004,428, Cl. 439-191.000.
Hayes Separations, Inc.: *See*—
Hayes, William V., 5,003,813, Cl. 73-49.200.
Hayes, William V., to Hayes Separations, Inc. Method and apparatus for monitoring storage tank leakage. 5,003,813, Cl. 73-49.200.
Hazbun, Edward A.: *See*—
Schon, Steven G.; and Hazbun, Edward A., 5,004,479, Cl. 44-302.000.
Hebert, Randy S.: *See*—
Durham, George R.; and Hebert, Randy S., 5,004,851, Cl. 585-260.000.
Hecht, Sidney M.: *See*—
Boehm, Jeffrey C.; Hecht, Sidney M.; Holden, Kenneth G.; Johnson, Randall K.; and Kingsbury, William D., 5,004,758, Cl. 514-283.000.
Hedstrom Corp.: *See*—
Boudreau, Robert J., 5,004,216, Cl. 267-179.000.
Hee, Roland, to JES, L.P. Magnetic snap assembly for connecting grounding cord to electrically conductive body band. 5,004,425, Cl. 439-37.000.
Heid, Walter: *See*—
Amrhein, Reinhard; Heid, Walter; and Muschong, Gunther, 5,004,015, Cl. 137-625.680.
Heidelberger Druckmaschinen: *See*—
Junghans, Rudi, 5,003,874, Cl. 101-348.000.
Helioprint Als: *See*—
Stovring, Knud S., 5,005,045, Cl. 355-68.000.
Helpenstein, Klaus: *See*—
Loth, Helmut; Helpenstein, Klaus; Podola, Tore; and Knop, Bernhard, 5,004,769, Cl. 524-43.000.
Hembert, Claude L. Device to protect the ends of fluid tanks made of composite materials. 5,004,120, Cl. 220-414.000.
Hemker, Wilfred J.: *See*—
Lochhead, Robert Y.; Castaneda, Janet Y.; and Hemker, Wilfred J., 5,004,598, Cl. 424-59.000.

Hemmer, Richard E.: *See—*
Goldburt, Efim S.; and Hemmer, Richard E., 5,004,625, Cl. 427-38.000.

Hendricks, James B., to Ketema Process Equipment Division. Invertible filter-type centrifuge with improved bearing and seal assembly. 5,004,540, Cl. 210-232.000.

Hendry Mechanical Works: *See—*
Sevier, Richard W.; and Keenan, James J., 5,004,107, Cl. 211-26.000.

Henke, Stephan: *See—*
Basler, Ekkehard; Bickel, Martin; Brocks, Dietrich; Gunzler, Volkmar; Henke, Stephan; and Hanauske-Abel, Hartmut, 5,004,748, Cl. 514-350.000.

Henkel Kommanditgesellschaft auf Aktien: *See—*
Emmerling, Winfried; Wichelhaus, Juergen; and Podola, Tore, 5,004,794, Cl. 528-52.000.
Loth, Helmut; Helpenstein, Klaus; Podola, Tore; and Knop, Bernhard, 5,004,769, Cl. 524-43.000.

Heppner, Joachim G.: *See—*
Bernard, Walter; Heppner, Joachim G.; and Schwarz, Karl H., 5,004,342, Cl. 356-350.000.

Hercules Incorporated: *See—*
Goss, Raymond W., 5,004,638, Cl. 428-95.000.
Schimpf, Warren C., 5,004,590, Cl. 425-447.200.

Herko, Samuel P.: *See—*
Shaulov, Avner A.; Herko, Samuel P.; Dorman, Donald R.; and Bhargava, Rameshwar N., 5,004,726, Cl. 505-1.000.

Herman Wangner GmbH & Co. KG: *See—*
Esser, Klaus; and Hacker, Hans-Eugen, 5,003,675, Cl. 28-141.000.

Herold, Stanley J.; Howard, Charles D.; and LaGrange, Donald E., to United States of America, Navy. Aerial flare and igniter. 5,003,881, Cl. 102-337.000.

Herry, Robert E. Fish lure. 5,003,720, Cl. 43-42.390.

Hershenson, Susan; and Thomson, Jody, to Cetus Corporation. Low pH pharmaceutical compositions of recombinant β-interferon. 5,004,605, Cl. 424-85.600.

Hessman, Ingemar; Post, Karl G. Y.; and Norgren, Lars E., to Santrade Limited. Cutting insert. 5,004,380, Cl. 407-114.000.

Hester, Charles F.: *See—*
Caulfield, H. John; Hester, Charles F.; Kinser, Jason M.; and Shamir, Joseph, 5,004,309, Cl. 350-3.680.

Heuft-Qualiplus B.V.: *See—*
Swart, Nicholaas C., 5,004,347, Cl. 356-394.000.

Hewlett-Packard Company: *See—*
Altendorf, John M.; and Wong, Marvin G., 5,005,070, Cl. 357-74.000.
King, Philip N., 5,005,008, Cl. 340-653.000.
Morris, Carroll E., Jr.; Balliew, Robert E.; Mathieu, Mark A.; and Johnsrud, Darrell B., 5,004,978, Cl. 324-158.00R.
Tullis, Barclay J.; and Kruger, James B., 5,004,340, Cl. 356-243.000.
Tung, Charles C., 5,005,139, Cl. 364-519.000.
Ty Tan, Michael R.; and Wang, Shih-Yuan, 5,004,313, Cl. 350-96.140.

Hibino, Katsuhiko: *See—*
Kozaki, Tetsuji; Ishikawa, Hiroshi; Yasui, Hideaki; Shimamoto, Mamoru; Hibino, Katsuhiko; and Suzuki, Motoshi, 5,004,264, Cl. 280-707.000.

Higashihara, Masaki: *See—*
Akashi, Akira; Kadohara, Terutake; Ohnuki, Ichiro; and Higashihara, Masaki, 5,005,037, Cl. 354-400.000.

Higgins, John; and McDonagh, Michael, to Alperk Limited. Food processing apparatus. 5,003,868, Cl. 99-357.000.

Highfill, Louis A.: *See—*
Cadwallader, George W.; Highfill, Louis A.; Kurdys, Gregory D.; and Turigliatto, Richard S., 5,004,589, Cl. 423-315.000.

Hijikigawa, Masaya: *See—*
Webb, Brian C.; Pedley, Derek G.; Prosser, Stephen J.; Hijikigawa, Masaya; and Furubayashi, Hisatoshi, 5,004,700, Cl. 437-42.000.

Hildermann, David F.: *See—*
Dornblaser, Norman E.; and Hildermann, David F., 5,003,753, Cl. 53-415.000.

Hildinger, Henry W.; and Carlson, Edwin D. Process for recycling and purifying condensate from a hydrocarbon or alcohol synthesis process. 5,004,862, Cl. 585-867.000.

Hile, Barry L.: *See—*
Legler, John G.; Folkerth, Harold E.; Flora, David D.; and Hile, Barry L., 5,004,027, Cl. 144-136.00R.

Hill, Amos G., to White Consolidated Industries, Inc. Close-trim mower deflector. 5,003,757, Cl. 56-17.400.

Hill, Kenneth O.; Johnson, Derwyn C.; and Lamont, Robert G., to Canada, Her Majesty the Queen in Right of, as represented by the Minister of Communications. Coupler fabrication techniques for dissimilar fibers. 5,004,316, Cl. 350-96.150.

Hill, Scott D.: *See—*
Mixon, Larry C.; Snyder, George W.; Hill, Scott D.; Johnson, Gregory L.; Wlodarski, J. Frank; von Spakovsky, Alexis P.; Emerson, John D.; Cole, James M.; and Tipton, John P., 5,003,883, Cl. 102-476.000.

Hillman, Robert S.; Cobb, Michael E.; Allen, Jimmy D.; Gibbons, Ian; Ostoich, Vladimir E.; and Winfrey, Laura J., to Biotrack, Inc. Capillary flow device. 5,004,923, Cl. 250-341.000.

Hiney, Leonard L.: *See—*
Terrell, John; Kadia, Paul M.; Hiney, Leonard L.; and Pfaff, Susan E., 5,003,807, Cl. 72-351.000.

Hinschlager, Robert A., to Huffy Corporation. Cover for the driving sprocket of a bicycle. 5,003,840, Cl. 74-594.200.

Hinzmann, Alfred; Shu, Timour T.; Drewnowski, Wojciech S.; and Preisner, Peter M., to Hauni Richmond, Inc. Tampon. 5,004,467, Cl. 604-904.000.

Hinzpeter, Juergen; and Gruedelbach, Hans-Dieter, to Wilhelm Fette GmbH. Process and apparatus for monitoring pressing forces in a tablet press. 5,004,576, Cl. 264-40.500.

Hirai, Isamu: *See—*
Sato, Osamu; and Hirai, Isamu, 5,005,042, Cl. 354-412.000.

Hirai, Tokuyuki: *See—*
Kugimiya, Shuzo; Fukumochi, Yoji; Nakamura, Ichiko; Hirai, Tokuyuki; and Suzuki, Hitoshi, 5,005,127, Cl. 364-419.000.

Hiramatsu, Takeo: *See—*
Hatta, Katuhiro; Hiramatsu, Takeo; and Takamiya, Bonnosuke, 5,003,842, Cl. 74-867.000.

Hirano, Mitsunori: *See—*
Okutsu, Eiichi; Hirano, Mitsunori; and Yagihara, Morio, 5,004,670, Cl. 430-265.000.

Hiraoka, Noriyuki: *See—*
Kakinoki, Yoshikazu; Nakashima, Masato; Koezuka, Tetsuo; Hiraoka, Noriyuki; Tsukahara, Hiroyuki; Suto, Yoshinori; Oshima, Yoshitaka; and Hashinami, Shinji, 5,004,929, Cl. 250-561.000.

Hirata, Eiji: *See—*
Tsubone, Akira; Tomiyoshi, Masanori; Yokomizo, Junichi; Tanaka, Nobuhiro; Moriguchi, Hideyuki; and Hirata, Eiji, 5,004,401, Cl. 414-786.000.

Hirata, Shinji, to West Electric Company, Ltd. Strobe apparatus. 5,004,958, Cl. 315-241.00P.

Hirohata, Michio: *See—*
Ogawa, Yukio; Hirohata, Michio; Kodaira, Takanori; and Miyawaki, Makoto, 5,005,038, Cl. 354-400.000.

Hirono, Shuichi: *See—*
Gohda, Eiichi; Tsubouchi, Hirohito; Nakayama, Hiroyuki; Hirono, Shuichi; Takahashi, Kozo; Hashimoto, Shuji; and Daikuhara, Yasushi, 5,004,805, Cl. 530-399.000.

Hirose, Hisashi: *See—*
Umehara, Keiichi; Hirose, Hisashi; and Kono, Kazuo, 5,004,915, Cl. 250-231.140.

Hirose, Ken-ichi: *See—*
Tamura, Mitsuhisa; Suzukamo, Gohu; and Hirose, Ken-ichi, 5,004,843, Cl. 568-670.000.

Hirose, Kenichi: *See—*
Sato, Hiroshi; Hirose, Kenichi; Nagai, Koichi; Yoshioka, Hiroshi; and Nagaoka, Yoshihiko, 5,004,846, Cl. 568-940.000.

Hirota, Katsuaki: *See—*
Iwamoto, Koji; Hamada, Kenichi; and Hirota, Katsuaki, 5,005,086, Cl. 358-227.000.

Hirschmann, Robert P.; Beard, William Q., Jr.; Mainz, Eric L.; Smith, Earl B.; and Little, Barry M., to Vulcan Chemicals. Manufacture of perchloroethylene and trichloroethylene by catalytic oxychlorination, and improved catalysts therefor. 5,004,849, Cl. 570-224.000.

Hitachi Chemical Company, Ltd.: *See—*
Hara, Yasuhiro; Inoue, Mitsuhiro; Baba, Hideo; Okazaki, Tadashi; and Kudo, Shigeru, 5,004,089, Cl. 192-107.00M.

Hitachi Construction Machinery Co., Ltd.: *See—*
Kanai, Takashi; Ochiai, Masami; Oshina, Morio; and Sonoda, Mitsuo, 5,003,776, Cl. 60-434.000.

Hitachi Denshi Kabushiki Kaisha: *See—*
Amano, Tetsuya; Mita, Seiichi; Izumita, Morishi; Doi, Nobukazu; Kaneko, Mamoru; Yamauchi, Hiroto; and Kasai, Susumu, 5,005,184, Cl. 375-14.000.

Hitachi Koki Co., Ltd.: *See—*
Haruki, Shinichi; Furuya, Yhuzi; and Tsujita, Akio, 5,005,051, Cl. 355-221.000.

Hitachi Koko Company, Limited: *See—*
Hayasaka, Hiroshi; and Nagata, Akio, 5,004,453, Cl. 494-39.000.

Hitachi, Ltd.: *See—*
Amano, Tetsuya; Mita, Seiichi; Izumita, Morishi; Doi, Nobukazu; Kaneko, Mamoru; Yamauchi, Hiroto; and Kasai, Susumu, 5,005,184, Cl. 375-14.000.
Ikeda, Shuji; Sasaki, Katsuro; Nagasawa, Kouichi; and Meguro, Satoshi, 5,005,068, Cl. 357-59.000.
Maejima, Hideo; and Masuda, Ikuro, 5,005,153, Cl. 364-900.000.
Nakada, Kunihiko; and Akao, Yasushi, 5,005,121, Cl. 364-200.000.
Nejime, Yoshito, 5,004,932, Cl. 307-201.000.
Sunagawa, Masao; Kubota, Kazuhiro; Ishii, Yoshitaro; and Satoh, Susumu, 5,003,663, Cl. 15-366.000.

Hitachi Maxell, Ltd.: *See—*
Sato, Kiyoshi; Yoshikawa, Hirokazu; Ikenari, Shigeru; and Yokoyama, Kenichi, 5,004,656, Cl. 429-162.000.

Hitachi Metals Ltd.: *See—*
Tanahashi, Masaaki; Hagiwara, Hiroyuki; and Fujii, Hiroyuki, 5,004,172, Cl. 242-54.00R.

Hitachi Video Engineering, Inc.: *See—*
Amano, Tetsuya; Mita, Seiichi; Izumita, Morishi; Doi, Nobukazu; Kaneko, Mamoru; Yamauchi, Hiroto; and Kasai, Susumu, 5,005,184, Cl. 375-14.000.

Hixson, William J. Quick adjust tappet assembly. 5,003,940, Cl. 123-90.540.

Hjulstrom, Richard A., to Electro-Films, Inc. Adjustment of thin film capacitors. 5,004,658, Cl. 430-5.000.

HMT Technology Corporation: *See—*
Lal, Brij B.; and Eltoukhy, Atef H., 5,004,652, Cl. 428-611.000.

Hobach, Michael W.: *See—*
Trame, Charles E.; Karsten, Robert A.; and Hobach, Michael W., 5,003,717, Cl. 40-518.000.

Hobbs, Simon H.: *See—*
Barger, Paul T.; Barder, Timothy J.; Lin, David Y.; and Hobbs, Simon H., 5,004,853, Cl. 585-481.000.

Hochman, Haim: *See—*
Landa, Benzion; Hochman, Haim; and Yacoub, Naseem, 5,004,165, Cl. 241-21.000.

Hoechst Aktiengesellschaft: *See—*
Baader, Ekkehard; Bickel, Martin; Brocks, Dietrich; Gunzler, Volkmar; Henke, Stephan; and Hanauske-Abel, Hartmut, 5,004,748, Cl. 514-350.000.
Fritz, Hans-Gerhard; and Loffel, Rudi, 5,005,194, Cl. 378-53.000.
Rohrscheid, Freimund; Siegemund, Gunter; and Lau, Jurgen, 5,004,797, Cl. 528-206.000.

Hoechst Celanese Corporation: *See—*
Broussard, Jerry A.; Auerbach, Andrew B.; Yang, Nan L.; Paul, James L.; Zheng, Yong C.; and Zhang, Chong L., 5,004,798, Cl. 528-230.000.
Gupta, Balaram, 5,004,762, Cl. 522-121.000.
Vicari, Richard; Costanza, John R.; Lamonte, Ronald R.; and Miano, Ralph M., 5,004,796, Cl. 528-179.000.

Hoeptner, Herbert W., to Custom Chrome, Inc. Dual spark plug ignition system for motorcycle internal combustion engine. 5,003,945, Cl. 123-310.000.

Hoff, Heinz: *See—*
Erber, Anton; Hoff, Heinz; Reuchlein, Gunter; Schaaf, Hanno; and Schiessl, Gerhard, 5,003,778, Cl. 60-517.000.

Hoffman, Ned, to Sports-Mitt International. Exercise apparatus. 5,004,227, Cl. 272-119.000.

Hoffmann-La Roche Inc.: *See—*
Leenhouts, Frans; and Schadt, Martin, 5,004,324, Cl. 350-347.00R.

Hofmann, Hartmut, to PPM Pure Metals GmbH. Production of phenylarsines. 5,004,821, Cl. 556-70.000.

Hog, Peter: *See—*
Dreschel, Jurgen; Hog, Peter; and Mobs, Stephan, 5,004,220, Cl. 271-184.000.

Hogeland, Robert. Article and method of improving exterior building appearance. 5,003,738, Cl. 52-202.000.

Hoke, A. Chyril. Lock protector. 5,003,795, Cl. 70-55.000.

Hoke Incorporated: *See—*
Dyer, John, 5,003,864, Cl. 92-132.000.

Holden, Alan G.: *See—*
Teleki, Bela; Holden, Alan G.; and Chong, Leang H., 5,004,991, Cl. 333-168.000.

Holden, Kenneth G.: *See—*
Boehm, Jeffrey C.; Hecht, Sidney M.; Holden, Kenneth G.; Johnson, Randall K.; and Kingsbury, William D., 5,004,758, Cl. 514-283.000.

Holl, Rolf: *See—*
Pahnke, Klaus-Dieter; Holl, Rolf; and Becker, Wilfried, 5,003,886, Cl. 102-521.000.

Holleman, Timothy W.; Doan, Phong D.; Brennen, Kenneth R.; and Swoyer, John M. Atraumatic screw-in lead. 5,003,992, Cl. 128-785.000.

Hollis, Ray A. Adjustable batting tee. 5,004,234, Cl. 273-26.00R.

Hollowell, George E.; and Sample, Hugh D., to Neuville Industries, Inc. Method and apparatus for producing socks. 5,004,132, Cl. 223-1.000.

Holroyd, Trevor J.; and Tracey, Timothy E., to Stresswave Technology Limited. Method and apparatus for testing the response of a stress wave sensor. 5,004,985, Cl. 324-727.000.

Holt, Jan D.: *See—*
Schmidt, Kenneth D.; and Holt, Jan D., 5,004,386, Cl. 410-62.000.

Holzl, Klaus, to TMC Corporation. Anti-theft device. 5,004,261, Cl. 280-612.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Matsumoto, Yukihiro; Yoshihara, Kenji; Kajiura, Tetsuya; Niizato, Tomonori; and Yamada, Noriyuki, 5,003,937, Cl. 123-90.120.
Shibata, Katsuhiro; Azuma, Yuichi; and Suzuki, Tsuguya, 5,004,497, Cl. 75-229.000.
Yakuwa, Masahiko; Itoh, Tomofumi; and Igarashi, Hisashi, 5,003,954, Cl. 123-479.000.

Honda, Kazuo; Matsuura, Atsushi; and Sano, Hisanori, to Toshiba Lighting & Technology Corporation. Single side-sealed metal vapor discharge lamp. 5,004,951, Cl. 313-631.000.

Honeywell Inc.: *See—*
Dankwort, Rudolph C.; and Klem, Charles D., 5,004,911, Cl. 250-227.210.
Hartmann, Jon P.; and Glasener, Ted W., 5,004,999, Cl. 340-539.000.
McCracken, William L.; McDonald, Paul D.; and Kirschner, Roger S., 5,004,310, Cl. 350-6.800.
Roth, Roger R., 5,004,972, Cl. 323-320.000.

Hoodenpyle, James W.; Robinson, James P.; and Wright, John W., to Howell Instruments, Inc. Aircraft brake tester. 5,003,818, Cl. 73-121.000.

Hooykaas, Carel W. J., to Pelt & Hooykas B.V. Bearing part for a gas bearing. 5,004,357, Cl. 384-121.000.

Hopkins, Richard H.: *See—*
Kun, Zoltan K.; Cresswell, Michael W.; and Hopkins, Richard H., 5,004,956, Cl. 315-169.300.

Horgan, John J.; and Ociepka, Val S., to Avco Corporation. Compact rectilinear heat exhanger. 5,004,044, Cl. 165-145.000.

Horiba, Ltd.: *See—*
Horii, Yoshio, 5,004,998, Cl. 340-507.000.

Horie, Nobuyuki: *See—*
Sakamoto, Noriaki; Maeda, Shigemi; Yamanaka, Toshihiro; Deguchi, Toshihisa; Horie, Nobuyuki; Yamaguchi, Takeshi; and Kojima, Kunio, 5,005,164, Cl. 369-48.000.
Yamanaka, Toshihiro; Maeda, Shigemi; and Horie, Nobuyuki, 5,005,165, Cl. 369-58.000.

Horii, Satoshi; and Fukase, Hiroshi, to Takeda Chemical Industries, Ltd. Inosose derivatives, production and use thereof. 5,004,838, Cl. 568-347.000.

Horii, Yoshio, to Horiba, Ltd. Ion-measuring apparatus for use in process. 5,004,998, Cl. 340-507.000.

Horikawa, Kazuo: *See—*
Takasaki, Yoshimi; and Horikawa, Kazuo, 5,004,906, Cl. 250-214.00A.

Horiuchi, Tetsuya: *See—*
Ida, Kozo; and Horiuchi, Tetsuya, 5,004,785, Cl. 525-305.000.

Horizons International Foods, Inc.: *See—*
Shanbhag, Sudhakar P.; Cousminer, Joseph J.; and Milani, Gerald, 5,004,616, Cl. 426-102.000.

Horne, G. Kent. Vehicle windowsill protective convering and arm rest apparatus. 5,004,292, Cl. 296-153.000.

Horsch, John D.: *See—*
Miller, Gregory A.; Pearson, Jeffery L.; and Horsch, John D., 5,004,266, Cl. 280-743.000.

Hosmer, Jimmy D., to Hosmer Machinery & Engineering, Inc. Nozzle texturizer for yarn manufacturing. 5,003,764, Cl. 57-333.000.

Hosmer Machinery & Engineering, Inc.: *See—*
Hosmer, Jimmy D., 5,003,764, Cl. 57-333.000.

Hosoi, Toshiaki. Drill. 5,004,384, Cl. 408-230.000.

Hospal Industrie: *See—*
Richalley, Gerard; and Burtin, Jacques, 5,004,548, Cl. 210-646.000.

House, Roy F.; Wilkinson, Andree H.; and Cowan, Jack C., to Venture Innovations, Inc. Well working compositions, method of decreasing the seepage loss from such compositions, and additive therefor. 5,004,553, Cl. 252-8.510.

Howard, Charles D.: *See—*
Herold, Stanley J.; Howard, Charles D.; and LaGrange, Donald E., 5,003,881, Cl. 102-337.000.

Howe, David J., to Proctor & Gamble Company. Controlled heating baking pan. 5,004,121, Cl. 220-458.000.

Howell Instruments, Inc.: *See—*
Hoodenpyle, James W.; Robinson, James P.; and Wright, John W., 5,003,818, Cl. 73-121.000.

Hoya Corporation: *See—*
Ishibai, Isao; and Otsu, Hitonobu, 5,004,330, Cl. 350-432.000.
Kobayashi, Masato; Yamaguchi, Yoh-Ichi; Sugawara, Minoru; and Yamashiro, Kazuhide, 5,005,075, Cl. 378-35.000.

Hsieh, George: *See—*
Cocherell, Francis E.; Harper, Homer C.; and Hsieh, George, 5,004,596, Cl. 424-52.000.

Huang, Chin-Ming. Two-stage water discharge mechanism for flush toilet tank. 5,003,644, Cl. 4-324.000.

Huang, Dennis. Driving structure for mini-sewing machine. 5,003,898, Cl. 112-220.000.

Huang, Shu-Jen: *See—*
Beckman, John A.; Huang, Shu-Jen; and Ebrat, Abdol R., 5,004,550, Cl. 210-710.000.

Huang, Yao-Tsung: *See—*
Liu, Ru-Shi; Huang, Yao-Tsung; Chu, Jau-Jier; and Liang, Jiuh-Ming, 5,004,723, Cl. 505-1.000.

Hubbard, Phillip W. Utility cart. 5,004,263, Cl. 280-645.000.

Huber, Jeffrey A., to Sundstrand Corporation. Turbo hydraulic unitized actuator. 5,003,772, Cl. 60-259.000.

Huber, Lothar, to Luk Lamellen und Kupplungsbau GmbH. Friction clutch. 5,004,087, Cl. 192-89.00B.

Hudson Associates, Inc.: *See—*
Sodec, Franc; Hudson, Donald L.; and Bolen, David T., 5,003,867, Cl. 98-31.600.

Hudson, Donald L.: *See—*
Sodec, Franc; Hudson, Donald L.; and Bolen, David T., 5,003,867, Cl. 98-31.600.

Hudson, William S.: *See—*
Robb, Wendell E.; and Hudson, William S., 5,003,642, Cl. 4-287.000.

Huels Aktiengesellschaft: *See—*
Kelkenberg, Heike, 5,004,564, Cl. 252-546.000.

Huet, Wilfred. Hose rupture valve. 5,004,010, Cl. 137-513.300.

Huff, Richard: *See—*
Elliott, Albert O., Jr., 5,004,383, Cl. 408-211.000.

Huffy Corporation: *See—*
Hinschlager, Robert A., 5,003,840, Cl. 74-594.200.

Hughes Aircraft Company: *See—*
Haseltine, Eric C.; and Jones, Helene H., 5,004,331, Cl. 350-443.000.
Isaak, Harlan, 5,003,870, Cl. 101-127.100.
Lam, Juan F.; and Hasenberg, Thomas C., 5,005,176, Cl. 372-10.000.
Vali, Victor; Chang, David B.; and Brownrigg, Patrick C., 5,004,914, Cl. 250-227.270.

Hughes, Francis R.: *See—*
Lipchak, John B.; Oblak, Tod A.; Bednar, Fred H.; Ciaramitaro, William; Hughes, Francis R.; Smith, John R.; and Gisoni, Gregory A., 5,005,142, Cl. 364-550.000.

Hughes, Robert J.; and Williams, Robert C. Masonry clip. 5,003,701, Cl. 33-409.000.

Humphries, Martyn; Nemcek, Jozef; Padget, John C.; and Mollett, Christopher C., to Imperial Chemical Industries PLC. Surface treatment with sulfonate ester polymer. 5,004,631, Cl. 427-385.500.
Hung, Yau Y. Dual-lens shearing interferometer. 5,004,345, Cl. 356-353.000.
Hunter, John A.; Scamans, Geoffrey M.; O'Callaghan, Wilfred B.; and Wycliffe, Paul A., to Alcan International Limited. Aluminium batteries. 5,004,654, Cl. 429-50.000.
Hurley, Leslie C., to Piezo Crystal Company. Temperature compensated crystal resonator found in a dual-mode oscillator. 5,004,987, Cl. 331-70.000.
Huron Technologies, Inc.: *See*—
Dong, Dennis F.; and Loftfield, Richard E., 5,004,626, Cl. 427-58.000.
Huschauer, Helmuth, to Vereinigte Kesselwerke AG. Method of and device for maintaining a parameter constant in a fluidized-bed furnace. 5,003,931, Cl. 122-4.00D.
Hutchinson, Donald O.: *See*—
Beaver, Phillip R.; DiGiacinto, Peter M.; Hutchinson, Donald O.; and Vega, Julio J., 5,004,847, Cl. 570-186.000.
Hutchinson, Francis G., to Imperial Chemical Industries PLC. Continuous release pharmaceutical compositions formed by freeze drying acetic acid solutions of polylactide. 5,004,602, Cl. 424-78.000.
Hutchison, Richard M., to Sundstrand Corporation. Method of scavenging air and oil and gear pump therefor. 5,004,407, Cl. 418-1.000.
Huttner, Gerhard; Kruckel, Peter; and Mock, Gerhard, to Schwan-Stabilo Schwanhausser GmbH & Co. Applicator device for cosmetic uses. 5,004,363, Cl. 401-75.000.
Huuf, Amanda: *See*—
Elliott, Albert O., Jr., 5,004,383, Cl. 408-211.000.
Huynh-Ba, Gia, to Du Pont de Nemours, E. I., and Company. Polymer blends containing isocyanate reacting agents. 5,004,784, Cl. 525-123.000.
Hyatt, John: *See*—
Greenwood, Eugene C.; and Hyatt, John, 5,004,455, Cl. 604-43.000.
Hybritech Incorporated: *See*—
Frincke, James M.; Bartholomew, Richard M.; and Dillman, Robert O., 5,004,606, Cl. 424-85.800.
Hydro Air Industries, Inc.: *See*—
Stamp, Roger A.; and Williams, Farrell D., 5,003,646, Cl. 4-542.000.
Ichige, Toshio: *See*—
Ishida, Nobuyoshi; Michimoto, Takashi; Miyake, Katsutaro; and Ichige, Toshio, 5,004,718, Cl. 502-217.000.
ICI Americas Inc.: *See*—
Jerusik, Russell J.; and Mahon, Paul F., 5,004,749, Cl. 514-372.000.
Ida, Kozo; and Horiuchi, Tetsuya, to Mitsubishi Rayon Co., Ltd. Light-diffusing methacrylic resin and process for production thereof. 5,004,785, Cl. 525-305.000.
Ida, Tomoyasu; Nohara, Makoto; and Seo, Nobuyuki, to Koyo Seiko Co., Ltd. Wheel bearing apparatus provided with compact wheel rotation speed detector lying within the outside periphery of the bearing apparatus. 5,004,980, Cl. 324-166.000.
Ide, Tohru, to Fuji Jukogyo Kabushiki Kaisha; and Van Doorne's Transmissie B.V. Belt for a continuously variable transmission. 5,004,450, Cl. 474-242.000.
Idemitsu Kosan Co., Ltd.: *See*—
Yamasaki, Komei; and Funaki, Keisuke, 5,004,649, Cl. 428-461.000.
Idemitsu Petrochemical Co., Ltd.: *See*—
Matsui, Kazufumi, 5,004,356, Cl. 383-63.000.
Iehisa, Nobuaki: *See*—
Yamazaki, Etsuo; Iehisa, Nobuaki; and Suzuki, Kazuhiro, 5,004,889, Cl. 219-121.610.
Igarashi, Hisashi: *See*—
Yakuwa, Masahiko; Itoh, Tomofumi; and Igarashi, Hisashi, 5,003,954, Cl. 123-479.000.
Igram, Dale J. Reconfigurable airfoil. 5,004,189, Cl. 244-219.000.
Iida, Shigeharu: *See*—
Yoshida, Tutomu; and Iida, Shigeharu, 5,004,825, Cl. 558-131.000.
Iida, Shoji; Miyazaki, Kazuo; and Takizawa, Nobuyuki, to Nippon Petrochemicals Company, Limited. Method for continuously producing low molecular weight polymer of conjugated diolefin. 5,004,857, Cl. 585-507.000.
Ikeda, Chikako: *See*—
Terauchi, Makoto; Ikeda, Chikako; and Aritomi, Mitsutoshi, 5,004,800, Cl. 528-351.000.
Ikeda, Shuji; Sasaki, Katsuro; Nagasawa, Kouichi; and Meguro, Satoshi, to Hitachi, Ltd. Semiconductor memory device. 5,005,068, Cl. 357-59.000.
Ikeda, Yuji: *See*—
Nakajima, Tsuyoshi; and Ikeda, Yuji, 5,005,144, Cl. 364-565.000.
Ikenari, Shigeru: *See*—
Sato, Kiyoshi; Yoshikawa, Hirokazu; Ikenari, Shigeru; and Yokoyama, Kenichi, 5,004,656, Cl. 429-162.000.
Ikes, Jacques; Le Fur, Joel; and Nugues, Pierre, to Thomson-CSF. Vacuum-tight window for microwave electron tube and travelling wave tube including this window. 5,004,952, Cl. 315-3.500.
Ikezaki, Yoshiyuki: *See*—
Sakaida, Atsuo; Ikezaki, Yoshiyuki; Iriguchi, Akira; and Inose, Toshio, 5,004,946, Cl. 310-328.000.
Ikumi, Nobuyuki, to Kabushiki Kaisha Toshiba. Three-dimensional computer graphics apparatus with two-port memory for storing depth information. 5,005,117, Cl. 364-200.000.
Ilkoy, Eva: *See*—
Jekkel nee Bokany, Antonia; Albrecht, Karoly; Ambrus, Gabor; Lang, Tibor; Szabo, Istvan M.; Ilkoy, Eva; Konczol, Kalman; Moravcsik, Imre; Hantos, Gabor; Simonovits, Emilia; Lengyel nee Szemenyei, Zsuzsanna; Vida, Zsuzsanna; and Csajagi, Eva, 5,004,695, Cl. 435-253.100.
Imaeda, Makoto: *See*—
Kuroyanagi, Masatoshi; Suzuki, Masahiko; Matsui, Kazuma; Imaeda, Makoto; Nagai, Kouzi; and Ito, Yoshiaki, 5,004,406, Cl. 417-273.000.
Imagawa, Kiyotaka, to Sakura Color Products Corporation. Water base erasable ink compositions. 5,004,763, Cl. 523-161.000.
Imahashi, Issei, to Tokyo Electron Limited. Wafer transport apparatus for ion implantation apparatus. 5,004,924, Cl. 250-442.100.
Imai, Hajime; Kito, Shozo; Harada, Shoichi; Yokoyama, Yoshinobu; Nakamura, Syuzi; Miyoshi, Shigetoshi; and Muramatsu, Tadao, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho; and Toyota Jidosha Kabushiki Kaisha. Device for locking shift lever of automatic transmission. 5,003,799, Cl. 70-247.000.
Imaseki, Takashi; and Kobari, Yuji, to Nissan Motor Co., Ltd. Slip control device for differential. 5,005,131, Cl. 364-426.020.
Imperial Chemical Industries PLC: *See*—
Humphries, Martyn; Nemcek, Jozef; Padget, John C.; and Mollett, Christopher C., 5,004,631, Cl. 427-385.500.
Hutchinson, Francis G., 5,004,602, Cl. 424-78.000.
Jerusik, Russell J.; and Mahon, Paul F., 5,004,749, Cl. 514-372.000.
Pinto, Alwyn, 5,004,592, Cl. 423-652.000.
Ramshaw, Colin, 5,004,526, Cl. 204-73.00A.
Sugavanam, Balasubramanyan; Worthington, Paul A.; and Clough, John M., 5,004,494, Cl. 71-92.000.
Inaba, Masahito: *See*—
Sato, Tsuyoshi; Inaba, Masahito; and Takata, Naoya, 5,004,349, Cl. 356-402.000.
Industrial Nut Corp.: *See*—
Spinger, J. William; and Schlett, Eugene, 5,004,389, Cl. 411-304.000.
Industrial Technology Research Institute: *See*—
Cheng, Syh Y.; and Wang, Hong W., 5,004,555, Cl. 252-62.900.
Liu, Ru-Shi; Huang, Yao-Tsung; Chu, Jau-Jier; and Liang, Jiuh-Ming, 5,004,723, Cl. 505-1.000.
Industrias Techno-Matic S.A.: *See*—
Gabas, Carlos, 5,004,138, Cl. 224-312.000.
Inertia Dynamics Corporation: *See*—
Everts, Robert G., 5,003,662, Cl. 15-330.000.
Innovative Building Products, Inc.: *See*—
Taylor, John R., 5,003,744, Cl. 52-308.000.
Inomata, Hiroshi: *See*—
Takaoka, Akio; and Inomata, Hiroshi, 5,004,824, Cl. 556-412.000.
Inose, Toshio: *See*—
Sakaida, Atsuo; Ikezaki, Yoshiyuki; Iriguchi, Akira; and Inose, Toshio, 5,004,946, Cl. 310-328.000.
Inoue, Hiroyuki: *See*—
Miyakawa, Akira; and Inoue, Hiroyuki, 5,005,025, Cl. 346-25.000.
Inoue, Manabu: *See*—
Fujino, Akihiko; Inoue, Manabu; Omaki, Takanobu; Nakai, Masaaki; Fujii, Akira; and Sekida, Minoru, 5,005,047, Cl. 354-442.000.
Inoue, Masahiro: *See*—
Koshikawa, Nobuo; and Inoue, Masahiro, 5,003,964, Cl. 128-4.000.
Inoue, Masaki, to Toyoda Gosei Co., Ltd. Method of manufacturing tubular vibration-insulating bushing. 5,003,684, Cl. 29-447.000.
Inoue, Masao: *See*—
Tsuno, Katsushige; and Inoue, Masao, 5,004,918, Cl. 250-311.000.
Inoue, Mitsuhiro: *See*—
Hara, Yasuhiro; Inoue, Mitsuhiro; Baba, Hideo; Okazaki, Tadashi; and Kudo, Shigeru, 5,004,089, Cl. 192-107.00M.
Inoue, Nobuhiro, to Tachi-S Co., Ltd. Pocket in automotive seat. 5,004,295, Cl. 297-191.000.
Inoue, Yoshihisa; and Arai, Yasunori, to Nakamichi Corporation. Recording and/or reproducing apparatus with cartridge lock mechanism. 5,005,093, Cl. 360-99.060.
Instrumentarium Corporation: *See*—
Kankkunen, Lauri P. A.; Piskunen, Raimo A. T.; and Rantala, Borje T., 5,003,981, Cl. 128-677.000.
Insys Ltd.: *See*—
Shisgal, Ben Z.; and Tzelnick, Tzvi, 5,004,997, Cl. 340-436.000.
Interior Specialists Corporation: *See*—
Jager, Paul A., 5,004,198, Cl. 248-225.100.
International Business Machines Corp.: *See*—
Cooke, Kevin K.; Dewitt, John R.; Galinis, Paul J.; and Koteff, Walter B., 5,004,866, Cl. 174-35.0GC.
Ellozy, Hamed A.; Jeanty, Henry H.; and Tappert, Charles C., 5,005,205, Cl. 382-3.000.
Ishikawa, Jun; and Takada, Kazuhiko, 5,004,207, Cl. 248-632.000.
Jackson, Kenneth P.; and Raver, Norman, 5,004,317, Cl. 350-96.200.
Krounbi, Mohamad T.; and Wang, Po-Kang, 5,005,096, Cl. 360-113.000.
Mace, Everitt W.; Sickler, Janet; and Srinivasan, Varadarajan, 5,004,508, Cl. 148-22.000.
Martin, Yves; and Wickramasinghe, Hemantha K., 5,003,815, Cl. 73-105.000.
International Clamp Company: *See*—
Miller, Jack E., 5,004,275, Cl. 285-373.000.
International Flavors & Fragrances Inc.: *See*—
Buckholz, Lawrence L., Jr.; and Kasper-Lehmann, Robin, 5,004,618, Cl. 426-281.000.
International Intec Patent Holding Establishment: *See*—
Harke, Alfons, 5,003,749, Cl. 52-703.000.

International Superconductor Corp.: *See*—
De, Dilip K., 5,004,724, Cl. 505-1.000.
Tallman, Richard L., 5,004,722, Cl. 505-1.000.
Interpharm Laboratories Ltd.: *See*—
Moay, Neomi; and Draghi, Enrica, 5,004,694, Cl. 435-240.270.
Interstate Chemical, Inc.: *See*—
Wilson, Ewert J. A., 5,004,850, Cl. 585-1.000.
Intertechnique: *See*—
Claude, Jacques, 5,003,632, Cl. 2-6.000.
InterVentional Technologies, Inc.: *See*—
Olson, Thomas E.; and Vigil, Dennis M., 5,003,918, Cl. 118-665.000.
Inverness Corporation: *See*—
Mann, Samuel J., 5,004,470, Cl. 606-188.000.
Mann, Samuel J., 5,004,471, Cl. 606-188.000.
Iowa State University Research Foundation, Inc.: *See*—
Robertson, Donald S.; and Stinard, Philip S., 5,004,864, Cl. 800-235.000.
Iriguchi, Akira: *See*—
Sakaida, Atsuo; Ikezaki, Yoshiyuki; Iriguchi, Akira; and Inose, Toshio, 5,004,946, Cl. 310-328.000.
Irikura, Tsutomu: *See*—
Kobashi, Yasuhiro; and Irikura, Tsutomu, 5,005,107, Cl. 361-540.000.
Irwin, Lawrence F., to Augerscope, Inc. Drain sealing apparatus. 5,004,119, Cl. 220-247.000.
Irwin, Robert S., to Du Pont de Nemours, E. I., and Company. Preparation of polyamides from unstable diamines. 5,004,834, Cl. 564-142.000.
Isaak, Harlan, to Hughes Aircraft Company. Antistretch screen printing arrangement. 5,003,870, Cl. 101-127.100.
Isayev, Avraam I., to University of Akron. Composite thermoplastic elastomer blend and process for preparing the same. 5,004,766, Cl. 524-30.000.
Ishibai, Isao; and Otsu, Hitonobu, to Hoya Corporation. Aspherical glass lens element formed by a low dispersion glass material. 5,004,330, Cl. 350-432.000.
Ishibashi, Kenji: *See*—
Hamada, Masataka; Ishida, Tokuji; and Ishibashi, Kenji, 5,005,039, Cl. 354-402.000.
Norita, Toshio; Ishida, Tokuji; Hamada, Masataka; and Ishibashi, Kenji, 5,005,040, Cl. 354-402.000.
Ishida, Kazuyuki: *See*—
Suzuki, Susumu; Ishida, Kazuyuki; and Ozaki, Takeo, 5,003,977, Cl. 128-633.000.
Ishida, Nobuyoshi; Michimoto, Takashi; Miyake, Katsutaro; and Ichige, Toshio, to Babcock-Hitachi Kabushiki Kaisha. Process for calcining a denitrating catalyst. 5,004,718, Cl. 502-217.000.
Ishida, Tokuji: *See*—
Hamada, Masataka; Ishida, Tokuji; and Ishibashi, Kenji, 5,005,039, Cl. 354-402.000.
Norita, Toshio; Ishida, Tokuji; Hamada, Masataka; and Ishibashi, Kenji, 5,005,040, Cl. 354-402.000.
Ishida, Toru: *See*—
Hakotani, Yasuhiko; Nakatani, Seiichi; Yuuhaku, Satoru; Nishimura, Tsutomu; and Ishida, Toru, 5,004,715, Cl. 501-136.000.
Ishii, Yoshitaro: *See*—
Sunagawa, Masao; Kubota, Kazuhiro; Ishii, Yoshitaro; and Satoh, Susumu, 5,003,663, Cl. 15-366.000.
Ishikawa, Akira; and Harada, Kazumasa, to Fuji Photo Film Co., Ltd. Packaging system. 5,003,751, Cl. 53-215.000.
Ishikawa Gasket Co., Ltd.: *See*—
Udagawa, Tsunekazu, 5,004,250, Cl. 277-236.000.
Ishikawa, Hiroshi; Hasegawa, Kazuo; and Gotoh, Masaki, to Alps Electric Co., Ltd. Optical reading device. 5,004,898, Cl. 235-475.000.
Ishikawa, Hiroshi: *See*—
Kozaki, Tetsuji; Ishikawa, Hiroshi; Yasui, Hideaki; Shimamoto, Mamoru; Hibino, Katsuhiko; and Suzuki, Motoshi, 5,004,264, Cl. 280-707.000.
Ishikawa, Jun; and Takada, Kazuhiko, to International Business Machines Corporation. Shock mounting structure and magnetic disk apparatus. 5,004,207, Cl. 248-632.000.
Ishikawa, Takatoshi: *See*—
Yoneyama, Hiroyuki; Takahashi, Osamu; Yoshida, Kazuaki; and Ishikawa, Takatoshi, 5,004,675, Cl. 430-377.000.
Ishikawa, Yuji: *See*—
Watanabe, Junji; and Ishikawa, Yuji, 5,005,052, Cl. 355-231.000.
Ishimoto, Kazumi: *See*—
Izumi, Yasuo; Ishimoto, Kazumi; and Makino, Yutaka, 5,003,692, Cl. 29-834.000.
Ishiwata, Shuichi: *See*—
Yamamoto, Yohzoh; Ishiwata, Shuichi; Yokoyama, Kenji; and Hasegawa, Kimio, 5,004,764, Cl. 523-400.000.
Ishizaka, Hideo: *See*—
Miyata, Yukihide; Ishizaka, Hideo; Saito, Yoshio; and Koizumi, Takashi, 5,004,582, Cl. 422-56.000.
Ishizaki, Akira: *See*—
Suda, Yasuo; Ohtaka, Keiji; Suzuki, Kenji; Ishizaki, Akira; and Aoyama, Keisuke, 5,005,041, Cl. 354-407.000.
Isotopenforschung Dr. Sauerwein GmbH: *See*—
Link, Rainer; and Nuding, Wolfgang, 5,003,831, Cl. 73-865.900.
Isowa Industry Company Ltd.: *See*—
Kawai, Hideshi, 5,004,173, Cl. 242-57.000.
Issurat, Hubert: *See*—
Thompson, Barry A., 5,004,603, Cl. 424-81.000.
Italiano, Anthony J., to Orschlen Co. Curved cable end connector. 5,003,837, Cl. 74-501.50R.
Ito, Shuji: *See*—
Ashizawa, Masaaki; Nishimoto, Kazuo; Oomura, Atsushi; and Ito, Shuji, 5,004,650, Cl. 428-463.000.
Ito, Yoshiaki: *See*—
Kuroyanagi, Masatoshi; Suzuki, Masahiko; Matsui, Kazuma; Imaeda, Makoto; Nagai, Kouzi; and Ito, Yoshiaki, 5,004,406, Cl. 417-273.000.
Itoh, Akira, to Itoh Seiki Co., Ltd. Face protector. 5,003,633, Cl. 2-9.000.
Itoh, Masataka: *See*—
Yoshinouchi, Atsushi; Itoh, Masataka; and Tsuchimoto, Shuhei, 5,004,905, Cl. 250-208.100.
Itoh Seiki Co., Ltd.: *See*—
Itoh, Akira, 5,003,633, Cl. 2-9.000.
Itoh, Tomofumi: *See*—
Yakuwa, Masahiko; Itoh, Tomofumi; and Igarashi, Hisashi, 5,003,954, Cl. 123-479.000.
Itoh, Toyotsugu: *See*—
Kawada, Sunao; Hashimoto, Takayoshi; Itoh, Toyotsugu; and Koyanagi, Makoto, 5,003,851, Cl. 82-1.110.
Itoi, Satoshi, to NEC Home Electronics Ltd. Window system synchronizing protective circuit. 5,005,190, Cl. 375-108.000.
ITT Corporation: *See*—
Cummiskey, Peter; Epstein, Marvin; Gilmour, Paul A.; and Kim, Richard, 5,005,168, Cl. 370-24.000.
Loch, Eugene W.; Ball, David D.; and Mack, George F., 5,004,129, Cl. 220-366.000.
Schap, William W., 5,004,280, Cl. 292-341.160.
Iura, Kazuo; Tsuji, Kazunori; and Saka, Kazuhito, to Sumitomo Wiring System, Ltd. Method and apparatus for manufacturing compact conductors. 5,003,761, Cl. 57-58.520.
Ivers, Douglas E.; and Nobles, Charles M., to Lord Corporation. Semi-active damper valve means and method. 5,004,079, Cl. 188-282.000.
Iwamatsu, Takanori: *See*—
Aono, Yoshihito; Iwamatsu, Takanori; Minowa, Morihiko; Takenaka, Sadao; Daidoh, Yoshimasa; Nakamura, Hiroshi; and Fujino, Nobutsugu, 5,005,186, Cl. 375-82.000.
Iwamori, Toshimichi: *See*—
Sakata, Yasushi; and Iwamori, Toshimichi, 5,005,067, Cl. 357-54.000.
Iwamoto, Akio; and Yuzuriha, Yoshiki, to Japan Electronic Control Systems Co., Ltd. Electronic fuel injection control system for a multi-fuel internal combustion engine and method therefore. 5,003,956, Cl. 123-494.000.
Iwamoto, Koji; Hamada, Kenichi; and Hirota, Katsuaki, to Sony Corporation. Focus control apparatus having two focusing speeds. 5,005,086, Cl. 358-227.000.
Iwanaga, Takeshi; and Ohnishi, Akio, to Sumitomo Rubber Industries, Ltd. Iron gold club head and method of producing the same. 5,004,242, Cl. 273-169.000.
Iyama, Kunihiko: *See*—
Shibazaki, Toshiji; Okano, Masaru; Kishida, Naoto; Ozaki, Yoshihiro; and Iyama, Kunihiko, 5,004,996, Cl. 338-36.000.
Izawa, Ichiro: *See*—
Yoshino, Yoshimi; Ao, Kenichi; Izawa, Ichiro; and Arasuna, Toshikazu, 5,005,064, Cl. 357-27.000.
Izumi, Yasuo; Ishimoto, Kazumi; and Makino, Yutaka, to Matsushita Electric Industrial Co., Ltd. Electric component mounting method. 5,003,692, Cl. 29-834.000.
Izumita, Morishi: *See*—
Amano, Tetsuya; Mita, Seiichi; Izumita, Morishi; Doi, Nobukazu; Kaneko, Mamoru; Yamauchi, Hiroto; and Kasai, Susumu, 5,005,184, Cl. 375-14.000.
Izumiya, Toshihide; Ohba, Yasuo; and Hatano, Ako, to Kabushiki Kaisha Toshiba. Semiconductor light-emitting diode and method of manufacturing the same. 5,005,057, Cl. 357-17.000.
Izumizaki, Masami: *See*—
Suzuki, Akio; Takada, Yoshihiro; Izumizaki, Masami; and Danzuka, Toshimitsu, 5,004,928, Cl. 250-559.000.
J. M. Huber Corporation: *See*—
Colwell, Joseph G., Jr., 5,004,539, Cl. 210-222.000.
J. M. Voith GmbH: *See*—
Schiel, Christian; and Hafner, Paul, 5,003,863, Cl. 92-61.000.
Jaccaud, Michel: *See*—
Millet, Jean-Christophe; and Jaccaud, Michel, 5,004,527, Cl. 204-82.000.
Jack, James: *See*—
Dingwall, John G.; Ehrenfreund, Josef; Hall, Roger G.; and Jack, James, 5,004,826, Cl. 558-169.000.
Jackson, Kenneth P.; and Raver, Norman, to International Business Machines Corp. Wire bond connection system with cancellation of mutual coupling. 5,004,317, Cl. 350-96.200.
Jacobson, Bo O., to SKF Industrial Trading and Development Co. B.V. Roller bearing. 5,004,359, Cl. 384-526.000.
Jaeger, Marc J., to University of Florida, The. Heat transfer system without mass transfer. 5,004,041, Cl. 165-8.000.
Jager, Paul A., to Interior Specialists Corporation. Fixture-mounting post and assembly method therefor. 5,004,198, Cl. 248-225.100.
Jakob, Claus P.: *See*—
Vogel, Hans-Henning; Rath, Hans P.; Jakob, Claus P.; and Oppenlaender, Knut, 5,004,478, Cl. 44-398.000.
Jambor, George F.: *See*—
Wirth, Gary J.; and Jambor, George F., 5,003,797, Cl. 70-180.000.

James, Robert B., Jr.: *See*—
Kalnes, Tom N.; and James, Robert B., Jr., 5,004,533, Cl. 208-50.000.
Jammet, Jean-Claude. Multiple socket attachment. 5,004,435, Cl. 439-652.000.
Jan, Yuh L.: *See*—
Edelman, William; Constantinou, Dennis; Stefanovski, Miles; Jan, Yuh L.; Fahlen, Theodore S.; Hansen, Ronald L.; and Kramasz, Kenneth J., 5,005,180, Cl. 372-57.000.
Janes, Norman F.: *See*—
Elliott, Michael; Janes, Norman F.; and Pulman, David A., 5,004,822, Cl. 556-115.000.
Janesick, James R., to California Institute of Technology. CCD imaging sensor with flashed backside metal film. 5,005,063, Cl. 357-24.000.
Jang, Sung H.: *See*—
Yeo, Jong K.; Kim, Chung S.; Lee, Dong J.; and Jang, Sung H., 5,004,774, Cl. 524-262.000.
Jang, Taek-Yong: *See*—
Kwon, Oh-Hyun; Jang, Taek-Yong; Shin, Jung-Hyun; and Choi, Won-Taek, 5,005,103, Cl. 361-313.000.
Janome Sewing Machine Co. Ltd.: *See*—
Hara, Kazumasa; Sano, Yasuro; Koike, Mikio; and Nishijima, Mitsuru, 5,003,896, Cl. 112-121.110.
Japan Aircraft Mfg. Co., Ltd.: *See*—
Okazaki, Kakuma; and Kitamura, Takayuki, 5,003,736, Cl. 52-108.000.
Japan Electronic Control Systems Co., Ltd.: *See*—
Iwamoto, Akio; and Yuzuriha, Yoshiki, 5,003,956, Cl. 123-494.000.
Jarrett, Bobby R., to United States of America, Navy. Switched comparator system for obtaining dynamic range. 5,004,183, Cl. 244-3.110.
Jasinski, Leon, to Motorola, Inc. System and method for optimally transmitting acknowledge back responses. 5,005,014, Cl. 340-825.440.
JCB Leasing Corp.: *See*—
Brown, John C., 5,003,759, Cl. 56-249.000.
Jeanty, Henry H.: *See*—
Ellozy, Hamed A.; Jeanty, Henry H.; and Tappert, Charles C., 5,005,205, Cl. 382-3.000.
Jeffrey, Roy R., Jr.; and Devoss, John. Engine heating unit. 5,003,941, Cl. 123-142.50R.
Jekkel nee Bokany, Antonia; Albrecht, Karoly; Ambrus, Gabor; Lang, Tibor; Szabo, Istvan M.; Ilkoy, Eva; Konczol, Kalman; Moravcsik, Imre; Hantos, Gabor; Simonovits, Emilia; Lengyel nee Szemenyei, Zsuzsanna; Vida, Zsuzsanna; and Csajagi, Eva, to Richter Gedeon Vegyeszeti Gyar R.T. Microbiological process for preparing 9α-hydroxy-4-androstene-3,17-dione. 5,004,695, Cl. 435-253.100.
Jenkner, Erwin. Drilling machine for planar face and/or end face drilling on panel-type workpieces or panel blanks. 5,004,381, Cl. 408-31.000.
Jensen, David G. Chain elongation indicator and method. 5,003,913, Cl. 116-208.000.
Jensen, Tom M.; and Shorey, Thomas H., to Boeing Company, The. Rollout stop. 5,004,387, Cl. 410-69.000.
Jeol, Ltd.: *See*—
Kondo, Yukihito, 5,004,919, Cl. 250-311.000.
Tsuno, Katsushige; and Inoue, Masao, 5,004,918, Cl. 250-311.000.
Jepson, Peter; and Tofield, Graham M., to Thorn Emi Flow Measurement Limited. Fluid meter. 5,003,810, Cl. 73-3.000.
Jerusik, Russell J.; and Mahon, Paul F., to Imperial Chemical Industries plc; and ICI Americas Inc. Concentrated aqueous solution of glutaraldehyde and 1,2-benzisothiazolin-3-one. 5,004,749, Cl. 514-372.000.
JES, L.P.: *See*—
Hee, Roland, 5,004,425, Cl. 439-37.000.
Jesco Products Company, Inc.: *See*—
Standlick, Ronald E., 5,004,125, Cl. 222-145.000.
Jewess, Gordon, to Sundstrand Corporation. Overfill filler pipe assembly. 5,004,074, Cl. 184-105.100.
Ji, Kebin: *See*—
Yu, Meng W.; Su, Shihuai; Chen, Yue Z.; Zheng, Ticheng; Ji, Kebin; Ling, Shou R.; Lin, Jian C.; Deng, Jianhui; and Zhang, Kunwu, 5,004,510, Cl. 148-146.000.
Jidosha Denki Kogyo K.K.: *See*—
Kobayashi, Kyoji; and Furuya, Takeo, 5,004,178, Cl. 242-107.000.
Jinnai, Shigeru: *See*—
Fukushima, Nobuo; Sakai, Shinji; Takdea, Osamu; Takei, Masahiro; Suzuki, Yasutomo; Okino, Tadashi; and Jinnai, Shigeru, 5,005,088, Cl. 360-69.000.
Johansen, Odvar: *See*—
Berg, Sven-Olof; Broden, Ingemar; and Johansen, Odvar, 5,004,395, Cl. 414-412.000.
Johns Hopkins University: *See*—
Halperin, Henry R., 5,003,982, Cl. 128-695.000.
Lapp, Roger H.; and Paraska, Theodore F., 5,003,687, Cl. 29-600.000.
Johnson, Christopher D.: *See*—
Hall, Randolph L.; and Johnson, Christopher D., 5,004,308, Cl. 350-1.700.
Johnson, Dale V.; and Gordon, John R., to Exxon Production Research Company. Chemical injection valve. 5,004,007, Cl. 137-501.000.
Johnson, Derwyn C.: *See*—
Hill, Kenneth O.; Johnson, Derwyn C.; and Lamont, Robert G., 5,004,316, Cl. 350-96.150.
Johnson, Gary K. Memory game. 5,004,244, Cl. 273-240.000.
Johnson, Gregory L.: *See*—
Mixon, Larry C.; Snyder, George W.; Hill, Scott D.; Johnson, Gregory L.; Wlodarski, J. Frank; von Spakovsky, Alexis P.; Emerson, John D.; Cole, James M.; and Tipton, John P., 5,003,883, Cl. 102-476.000.
Johnson Matthey Public Limited Company: *See*—
Larminie, James, 5,004,424, Cl. 434-301.000.
Teleki, Bela; Holden, Alan G.; and Chong, Leang H., 5,004,991, Cl. 333-168.000.
Johnson, Randall K.: *See*—
Boehm, Jeffrey C.; Hecht, Sidney M.; Holden, Kenneth G.; Johnson, Randall K.; and Kingsbury, William D., 5,004,758, Cl. 514-283.000.
Johnson, Richard L.: *See*—
Montuoro, Lou D.; Vandarakis, Toni L.; and Johnson, Richard L., 5,004,305, Cl. 312-214.000.
Johnson, Severne: *See*—
Kleven, Lawrence P.; Agranat, Edward A.; Crisafulli, Jerry; Robinson, Hugh; Smith, David J.; Wiseley, Thomas; Fortier, Richard C.; Johnson, Severne; and Menzin, Marvin, 5,004,954, Cl. 315-106.000.
Johnson, William B.: *See*—
Claar, Terry D.; Johnson, William B.; and Rapp, Robert A., 5,004,714, Cl. 501-134.000.
Johnsrud, Darrell B.: *See*—
Morris, Carroll E., Jr.; Balliew, Robert E.; Mathieu, Mark A.; and Johnsrud, Darrell B., 5,004,978, Cl. 324-158.00R.
Johnston, Norman J.; St. Clair, Terry L.; Baucom, Robert M.; and Gleason, John R., to United States of America, National Aeronautics and Space Administration. Preparing composite materials from matrices of processable aromatic polyimide thermoplastic blends. 5,004,575, Cl. 264-136.000.
Jones, Arthur. Method and apparatus for exercising or testing rotary torso muscles. 5,004,230, Cl. 272-134.000.
Jones, Brian C., to Thermodynetics, Inc. Heat exchange method and apparatus. 5,004,046, Cl. 165-156.000.
Jones, Helene H.: *See*—
Haseltine, Eric C.; and Jones, Helene H., 5,004,331, Cl. 350-443.000.
Jones, Mark L.: *See*—
Tibbitts, Gordon A.; and Jones, Mark L., 5,004,057, Cl. 175-408.000.
Jones, Ronald G., to Propellex. Delay detonator. 5,003,879, Cl. 102-204.000.
Jordan, Dale A., to Tektronix, Inc. Adjustable electronic graticules for measuring waveform distortions. 5,004,975, Cl. 324-121.00R.
Joseph, Craig A.: *See*—
Baker, Charles L.; Cody, George D.; Joseph, Craig A.; and Sela, Uri, 5,004,152, Cl. 239-8.000.
Joset, Gerard, to Thomson-Brandt Armements. Safety device for releasable charges. 5,003,861, Cl. 89-1.550.
Joshi, Shrinivas G. Acoustic wave microsensors for measuring fluid flow. 5,003,822, Cl. 73-204.230.
Joy Technologies Inc.: *See*—
Marshall, Gary C., 5,004,098, Cl. 198-847.000.
Juds, Mark A.: *See*—
Theisen, Peter J.; Wycklendt, Daniel A.; Juds, Mark A.; and Moldovan, Peter K., 5,004,874, Cl. 200-144.00R.
Julemont, Michel; Zocchi, Germaine; Mineo, Nunzio; and Fonsny, Pierre, to Colgate-Palmolive Company. Built thickened stable non-aqueous cleaning composition and method of use. 5,004,556, Cl. 252-99.000.
Jung, Rudiger, to Flutec Fluidtechnische Gerate GmbH. Two-way flow valve. 5,004,006, Cl. 137-501.000.
Junghans, Rudi, to Heidelberger Druckmaschinen. Distributor roller for an inking unit of a printing press. 5,003,874, Cl. 101-348.000.
Jurgensmeyer, Robert F.: *See*—
Ketterlin, William S.; and Jurgensmeyer, Robert F., 5,003,928, Cl. 119-73.000.
Juschenko, Konstantin A.; Varenchuk, Pavel A.; Kovalev, Valentin D.; Chvertko, Anatoly I.; Privalov, Nikolai T.; and Kuzmenko, Vladimir G. Apparatus for overhead submerged-arc welding. 5,004,885, Cl. 219-73.200.
K. W. Muth Company, Inc.: *See*—
Roberts, John K., 5,005,009, Cl. 340-705.000.
Kabelschlepp Gesellschaft mit beschrankter Haftung: *See*—
Moritz, Werner, 5,003,765, Cl. 59-78.100.
Kabushiki Kaisha Machida Seisakusho: *See*—
Koshikawa, Nobuo; and Inoue, Masahiro, 5,003,964, Cl. 128-4.000.
Kabushiki Kaisha Pilot: *See*—
Tomura, Yoshihiro; Maruhashi, Keiji; and Ozawa, Nobuyuki, 5,004,364, Cl. 401-110.000.
Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Nebashi, Yukichi; and Wada, Takaaki, 5,004,515, Cl. 156-350.000.
Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
Imai, Hajime; Kito, Shozo; Harada, Shoichi; Yokoyama, Yoshinobu; Nakamura, Syuzi; Miyoshi, Shigetoshi; and Muramatsu, Tadao, 5,003,799, Cl. 70-247.000.
Umehara, Keiichi; Hirose, Hisashi; and Kono, Kazuo, 5,004,915, Cl. 250-231.140.
Kabushiki Kaisha Toshiba: *See*—
Ikumi, Nobuyuki, 5,005,117, Cl. 364-200.000.
Izumiya, Toshihide; Ohba, Yasuo; and Hatano, Ako, 5,005,057, Cl. 357-17.000.
Maeda, Satoshi; and Sawada, Shizuo, 5,004,704, Cl. 437-195.000.
Murayama, Akihiro; and Koyama, Takeshi, 5,004,935, Cl. 307-353.000.
Narikiyo, Hidetoshi; Gotou, Yukifumi; and Chuma, Yoshihiro, 5,004,149, Cl. 236-49.300.

Samata, Shuichi; and Matsushita, Yoshiaki, 5,004,702, Cl. 437-57.000.
Shimamura, Keizo; Amano, Kagetaka; Aisaka, Tatsuryoshi; Hanai, Satoshi; and Nagata, Kohsoku, 5,004,498, Cl. 75-233.000.
Tsujimoto, Hisanaga, 5,005,091, Cl. 360-96.500.
Watanabe, Junji; and Ishikawa, Yuji, 5,005,052, Cl. 355-231.000.
Yamakawa, Tsutomu; and Kobayashi, Hiroaki, 5,004,904, Cl. 250-207.000.

Kaczmarczyk, Donald J.: *See*—
Rezmer, Leonard D.; Kaczmarczyk, John R.; Kaczmarczyk, Gerald R.; and Kaczmarczyk, Donald J., 5,004,024, Cl. 141-298.000.

Kaczmarczyk, Gerald R.: *See*—
Rezmer, Leonard D.; Kaczmarczyk, John R.; Kaczmarczyk, Gerald R.; and Kaczmarczyk, Donald J., 5,004,024, Cl. 141-298.000.

Kaczmarczyk, John R.: *See*—
Rezmer, Leonard D.; Kaczmarczyk, John R.; Kaczmarczyk, Gerald R.; and Kaczmarczyk, Donald J., 5,004,024, Cl. 141-298.000.

Kadis, Paul M.: *See*—
Terrell, John; Kadis, Paul M.; Hiney, Leonard L.; and Pfaff, Susan E., 5,003,807, Cl. 72-351.000.

Kadohara, Terutake: *See*—
Akashi, Akira; Kadohara, Terutake; Ohnuki, Ichiro; and Higashihara, Masaki, 5,005,037, Cl. 354-400.000.

Kadota, Kuninobu; Kohno, Yoshihide; and Koseki, Hiroyuki, to Bridgestone Corp. Pneumatic tire with a strip reinforcing laminate having filaments arranged together in an undulating form. 5,004,031, Cl. 152-538.000.

Kaettlitz, Wolfgang: *See*—
Wahl, Hans-Peter; Schlueter, Rudolf; Kaettlitz, Wolfgang; and Loos, Rolf, 5,004,545, Cl. 210-510.100.

Kafai, Malakeh B. Bed sheet assembly. 5,003,655, Cl. 5-496.000.

Kainou, Kikuo: *See*—
Fukada, Tetsuji; Wakamiya, Masayuki; and Kainou, Kikuo, 5,003,824, Cl. 73-651.000.

Kaiser, Peter: *See*—
Viertel, Lothar; Kaiser, Peter; and Welter, Patrick, 5,004,288, Cl. 296-97.110.

Kajiura, Tetsuya: *See*—
Matsumoto, Yukihiro; Yoshihara, Kenji; Kajiura, Tetsuya; Niizato, Tomonori; and Yamada, Noriyuki, 5,003,937, Cl. 123-90.120.

Kajiwara, Manabu: *See*—
Kano, Atsushi; Mizuno, Masayuki; Kajiwara, Manabu; Sakaue, Kenji; Abe, Yuji; and Nakamura, Kazuo, 5,004,217, Cl. 271-10.000.

Kakegawa, Hisao: *See*—
Satoh, Toshio; Niiro, Yasunori; Kakegawa, Hisao; and Matsumoto, Hitoshi, 5,004,742, Cl. 514-226.500.

Kakinoki, Yoshikazu; Nakashima, Masato; Koezuka, Tetsuo; Hiraoka, Noriyuki; Tsukahara, Hiroyuki; Suto, Yoshinori; Oshima, Yoshitaka; and Hashinami, Shinji, to Fujitsu Limited. Optical system for detecting three-dimensional shape. 5,004,929, Cl. 250-561.000.

Kalantar, S. Javad, to Phyb U.S.A., Inc. Simulated nipple for infants. 5,004,473, Cl. 606-234.000.

Kalinoski, Richard W.; Chitty, Gordon W.; and Vignos, James H., to Foxboro Company, The. Piezoelectric differential pressure vortex sensor. 5,003,827, Cl. 73-861.240.

Kalnes, Tom N.; and James, Robert B., Jr., to UOP. Process for treating an organic stream containing a non-distillable component to produce an organic vapor and a solid. 5,004,533, Cl. 208-50.000.

Kameshima, Makoto. Balance shaft. 5,004,236, Cl. 273-80.00B.

Kamio, Masashi: *See*—
Tobuse, Hiroaki; Murakami, Hidenobu; and Kamio, Masashi, 5,005,138, Cl. 364-519.000.

Kamishima, Hiroyuki: *See*—
Kato, Koichiro; Fukuhara, Hiroshige; Kamishima, Hiroyuki; and Tsukahara, Hitoshi, 5,005,021, Cl. 343-717.000.

Kamiya, Masakuni: *See*—
Matsuo, Yoshio; Nakano, Hirofumi; Kamiya, Masakuni; and Matsui, Kezuo, 5,004,580, Cl. 419-65.000.

Kamla, Jeffrey R.: *See*—
Olson, Larry D.; and Kamla, Jeffrey R., 5,004,775, Cl. 524-371.000.

Kanada, Tokio, to Sony Corporation. Disk drive with stabilizer block for insuring stable contact between a read/write head and a flexible recording medium. 5,005,098, Cl. 360-130.340.

Kanai, Takashi; Ochiai, Masami; Oshina, Morio; and Sonoda, Mitsuo, to Hitachi Construction Machinery Co., Ltd. Hydraulic drive system. 5,003,776, Cl. 60-434.000.

Kanda, Kunio, to Fanuc Ltd. Method of arranging data on a RAM for display. 5,005,012, Cl. 340-750.000.

Kanda, Masao, to Pioneer Electronic Corporation. Method and apparatus of image processing. 5,005,080, Cl. 358-160.000.

Kanebo, Ltd.: *See*—
Saka, Kenji; Terai, Masao; and Yamamoto, Kanji, 5,003,966, Cl. 128-39.000.

Kaneko, Mamoru: *See*—
Amano, Tetsuya; Mita, Seiichi; Izumita, Morishi; Doi, Nobukazu; Kaneko, Mamoru; Yamauchi, Hiroto; and Kasai, Susumu, 5,005,184, Cl. 375-14.000.

Kaneko, Shozo; and Kinoshita, Masaaki, to Mitsubishi Jukogyo Kabushiki Kaisha. Pulverized coal combustion method. 5,003,891, Cl. 110-341.000.

Kaneko, Shuzo: *See*—
Tamura, Yasuyuki; and Kaneko, Shuzo, 5,005,028, Cl. 346-76.00R.

Kang, Cheong J.; and Kang, Seok J. Door lock having security device. 5,004,278, Cl. 292-169.180.

Kang, Seok J.: *See*—
Kang, Cheong J.; and Kang, Seok J., 5,004,278, Cl. 292-169.180.

Kankkunen, Lauri P. A.; Piskunen, Raimo A. T.; and Rantala, Borje T., to Instrumentarium Corporation. Identification method for the cuff size in a sphygmomanometer and flow restriction means required in identification. 5,003,981, Cl. 128-677.000.

Kanne, Diane D., to Union Oil Company of California. Air pollution reduction. 5,004,480, Cl. 44-387.000.

Kano, Atsushi; Mizuno, Masayuki; Kajiwara, Manabu; Sakaue, Kenji; Abe, Yuji; and Nakamura, Kazuo, to Mita Industrial Co., Ltd. Paper feeding device. 5,004,217, Cl. 271-10.000.

Kao Corporation: *See*—
Tsubone, Akira; Tomiyoshi, Masanori; Yokomizo, Junichi; Tanaka, Nobuhiro; Moriguchi, Hideyuki; and Hirata, Eiji, 5,004,401, Cl. 414-786.000.

Kappler, Guenter; and Rist, Dieter, to Bayerische Motoren Werke Aktiengesellschaft. Gas turbine installation. 5,003,768, Cl. 60-39.230.

Karita, Seiichiro: *See*—
Takahashi, Hiroto; Karita, Seiichiro; and Sato, Koichi, 5,005,024, Cl. 346-1.100.

Karsten, Robert A.: *See*—
Trame, Charles E.; Karsten, Robert A.; and Hobach, Michael W., 5,003,717, Cl. 40-518.000.

Karten, Harvey J.: *See*—
Erichsen, Jonathan T.; Evinger, Craig; and Karten, Harvey J., 5,004,683, Cl. 435-7.210.

Kasai, Susumu: *See*—
Amano, Tetsuya; Mita, Seiichi; Izumita, Morishi; Doi, Nobukazu; Kaneko, Mamoru; Yamauchi, Hiroto; and Kasai, Susumu, 5,005,184, Cl. 375-14.000.

Kase, Hiroshi: *See*—
Yasuzawa, Toru; Nakanishi, Satoshi; Murakata, Chikara; Kase, Hiroshi; Sano, Hiroshi; and Yamada, Koji, 5,004,833, Cl. 536-18.200.

Kasper-Lehmann, Robin: *See*—
Buckholz, Lawrence L., Jr.; and Kasper-Lehmann, Robin, 5,004,618, Cl. 426-281.000.

Kataoka, Kenichi; and Tsukimoto, Takayuki, to Canon Kabushiki Kaisha. Control apparatus for vibration driven motor. 5,004,964, Cl. 318-128.000.

Katayama, Masashi: *See*—
Namiki, Tomizo; Suzuki, Tamotsu; and Katayama, Masashi, 5,004,668, Cl. 430-256.000.

Katayama, Masato: *See*—
Arahara, Kozo; Fukui, Tetsuro; Fukumoto, Hiroshi; Katayama, Masato; and Takasu, Yoshio, 5,004,667, Cl. 430-255.000.

Katayama, Shigeki: *See*—
Hane, Toshioki; and Katayama, Shigeki, 5,004,648, Cl. 428-364.000.

Kato, Hitoshi: *See*—
Nakao, Shinroku; Suzuki, Yoshiyuki; and Kato, Hitoshi, 5,004,253, Cl. 280-47.380.

Kato, Katsuaki: *See*—
Mochida, Ei; Murakami, Kimihiro; Kato, Kazuo; Kato, Katsuaki; Okuda, Jun; and Miwa, Ichitomo, 5,004,751, Cl. 514-390.000.

Kato, Kazuo: *See*—
Mochida, Ei; Murakami, Kimihiro; Kato, Kazuo; Kato, Katsuaki; Okuda, Jun; and Miwa, Ichitomo, 5,004,751, Cl. 514-390.000.

Kato, Koichiro; Fukuhara, Hiroshige; Kamishima, Hiroyuki; and Tsukahara, Hitoshi, to Nissan Motor Company, Limited. Antenna unit for vehicle. 5,005,021, Cl. 343-717.000.

Kato, Senji; and Oba, Hidehiro, to Toyota Jidosha Kabushiki Kaisha. Apparatus for control and intake air amount prediction in an internal combustion engine. 5,003,950, Cl. 123-422.000.

Kato, Shinji: *See*—
Takagi, Soya; Mori, Kazuhiko; Kawasaki, Minoru; and Kato, Shinji, 5,004,581, Cl. 420-487.000.

Katoh, Kazunobu: *See*—
Adachi, Keiichi; Katoh, Kazunobu; and Kawamura, Kouichi, 5,004,674, Cl. 430-333.000.

Kaufman, Randal J.; and Pittman, Debra, to Genetics Institute, Inc. Production of procoagulant proteins. 5,004,803, Cl. 530-383.000.

Kavitsky, Avraham: *See*—
Kofman, Anatoly; and Kavitsky, Avraham, 5,003,798, Cl. 70-238.000.

Kawada, Haruki: *See*—
Nishimura, Yukuo; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Nakagiri, Takashi; Saito, Kenji; Kimura, Toshiaki; Matsuda, Hiroshi; Sakai, Kunihiro; and Miyazaki, Toshihiko, 5,004,671, Cl. 430-286.000.

Kawada, Sunao; Hashimoto, Takayoshi; Itoh, Toyotsugu; and Koyanagi, Makoto, to Konica Corporation. Method of manufacturing a photoreceptor. 5,003,851, Cl. 82-1.110.

Kawahara, Hideo; Sakata, Nobuhiro; Coulon, Jean-Claude; and Lovera, Patrick, to Saint-Gobain Vitrage. Distribution of powder for making coated glass. 5,004,503, Cl. 106-287.180.

Kawai, Hideshi, to Isowa Industry Company Ltd. Method of controlling web feeding device. 5,004,173, Cl. 242-57.000.

Kawai, Jyoji: *See*—
Sanada, Kazunori; and Kawai, Jyoji, 5,005,141, Cl. 364-550.000.

Kawamoto, Masakazu, to Fujitsu Limited. Diagnostic system in a data processing system. 5,005,172, Cl. 371-18.000.

Kawamura, Kouichi: *See*—
Adachi, Keiichi; Katoh, Kazunobu; and Kawamura, Kouichi, 5,004,674, Cl. 430-333.000.

Kawasaki, Minoru: *See—*
Takagi, Soya; Mori, Kazuhiko; Kawasaki, Minoru; and Kato, Shinji, 5,004,581, Cl. 420-487.000.

Kawasaki Steel Corporation: *See—*
Kenmochi, Kazuhito; Yarita, Ikuo; Fukuhara, Akihiko; Komatu, Tomio; and Kishida, Akira, 5,003,804, Cl. 72-39.000.
Sakaguchi, Shuichi; Yamaguchi, Tadamasa; and Yamashita, Itaru, 5,004,884, Cl. 219-73.000.

Kawauchi, Susumu: *See—*
Tsuji, Masahiro; Kawauchi, Susumu; and Nakayama, Hiroshi, 5,004,520, Cl. 156-630.000.

Kazama, Toshio, to NHK Spring Co., Ltd. Contact probe. 5,004,977, Cl. 324-158.00P.

Kazmierczak, Irvin J.: *See—*
Sardano, Peter A.; and Kazmierczak, Irvin J., 5,004,218, Cl. 271-35.000.

Keating, Raymond: *See—*
Connell, Richard A.; Keating, Raymond; Sansone, Ronald P.; and Schumacher, Karl H., 5,005,124, Cl. 364-401.000.

Keenan, James J.: *See—*
Sevier, Richard W.; and Keenan, James J., 5,004,107, Cl. 211-26.000.

Keil, Charles F. Antenna position warning device. 5,003,911, Cl. 116-28.00R.

Kelbe, Richard R., to Eastman Kodak Company. Camera apparatus for magnetically recording on film. 5,005,031, Cl. 354-106.000.

Kelkenberg, Heike, to Huels Aktiengesellschaft. N-alkylglycamino compounds, a process for producing them, and their use. 5,004,564, Cl. 252-546.000.

Keller, Teddy M.; and Price, Thomas R., deceased (by Price, Carolyn R., legal representative), to United States of America, Navy. Polymer of dithioether-linked phthalonitrile. 5,004,801, Cl. 528-360.000.

Kelley, Larry W.: *See—*
Carlson, Harold L.; DeWitt, Michael D.; Martel, Louis, Jr.; Kelley, Larry W.; and Tayon, Jeffrey E., 5,004,077, Cl. 188-2.00D.

Kelly, Michael J. Button die holder. 5,003,852, Cl. 82-158.000.

Kelly, Ray G., to Angeles Nursery Toys, Inc. Nestable cot and end connector therefor. 5,003,649, Cl. 5-8.000.

Kenmochi, Kazuhito; Yarita, Ikuo; Fukuhara, Akihiko; Komatu, Tomio; and Kishida, Akira, to Kawasaki Steel Corporation. Method for pre-processing stainless steel strip intended to be cold-rolled. 5,003,804, Cl. 72-39.000.

Kent State University: *See—*
West, John L., 5,004,323, Cl. 350-346.000.

Kerr-McGee Chemical Corporation: *See—*
Leonard, Robert E., 5,003,774, Cl. 60-275.000.

Kersey, Robert L., to Tripar Incorporated. Compositions and articles for stimulating taste receptors. 5,003,995, Cl. 131-359.000.

Kester, Jervis D.; and Redington, Clarence P., to United Technologies Corporation. Fuel distribution valve for a combustion chamber. 5,003,771, Cl. 60-243.000.

Kestler, Jeffrey L. Athletic supporter. 5,003,972, Cl. 128-158.000.

Ketema Process Equipment Division: *See—*
Hendricks, James B., 5,004,540, Cl. 210-232.000.

Ketterlin, William S.; and Jurgensmeyer, Robert F. Freeze resistant animal watering installation. 5,003,928, Cl. 119-73.000.

Kidachi, Atsushi: *See—*
Niki, Motohiro; Niki, Etsuko; Kidachi, Misako; Kidachi, Atsushi; Niki, Mieko; Lee, Kap J.; and Lee, Yun, 5,003,922, Cl. 119-15.000.

Kidachi, Misako: *See—*
Niki, Motohiro; Niki, Etsuko; Kidachi, Misako; Kidachi, Atsushi; Niki, Mieko; Lee, Kap J.; and Lee, Yun, 5,003,922, Cl. 119-15.000.

Kiku, Yutaro, to Du Pont de Nemours, E. I., and Company. Multifunctional card having an electromagnetic wave protection. 5,005,106, Cl. 361-424.000.

Kikuchi, Takashi; and Aoyagi, Shigeo, to Alpine Electronics Inc. Automatic cassette tape changer. 5,005,090, Cl. 360-92.000.

Kikuchi, Yoshiharu: *See—*
Tojo, Tetsuo; Okada, Keiji; Nakahara, Takashi; and Kikuchi, Yoshiharu, 5,004,787, Cl. 525-332.100.

Kilrush Limited: *See—*
Nigay, Pierre, 5,004,463, Cl. 604-329.000.

Kim, Chong K.: *See—*
Arthurs, Edward; Goodman, Matthew S.; Kim, Chong K.; and Lee, Tony T., 5,005,167, Cl. 370-4.000.

Kim, Chung S.: *See—*
Yeo, Jong K.; Kim, Chung S.; Lee, Dong J.; and Jang, Sung H., 5,004,774, Cl. 524-262.000.

Kim, Myung S.: *See—*
Oh, Myung H.; Lee, Kyung J.; Chung, In J.; Lee, Nam Y.; and Kim, Myung S., 5,004,573, Cl. 264-61.000.

Kim, Richard: *See—*
Cummiskey, Peter; Epstein, Marvin; Gilmour, Paul A.; and Kim, Richard, 5,005,168, Cl. 370-24.000.

Kim, Soonih; Takeda, Kazuhisa; and Sasatani, Seiei, to Ono Pharmaceutical Co., Ltd. Pharmaceutical compositions comprising esters or amides as active ingredients. 5,004,612, Cl. 424-450.000.

Kim, Young D.; and Ha, Byung J., to Pacific Chemical Co., Ltd. Quaternary ammonium-substituted sterol derivatives. 5,004,737, Cl. 514-182.000.

Kim, Young Sul. 1,1-dioxopenicillanoyl oxymethyl D-6-(α-(methyleneamino) phenylacetamido)-penicillanate and a process for the preparation thereof. 5,004,738, Cl. 514-195.000.

Kim, Youngchol. Sun blind for use in automobile. 5,004,290, Cl. 296-99.100.

Kimmet, Mark S.: *See—*
Van Blaircum, Bennie A.; Harwood, Jon W.; and Kimmet, Mark S., 5,004,069, Cl. 181-282.000.

Kimura, Toshiaki: *See—*
Nishimura, Yukuo; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Nakagiri, Takashi; Saito, Kenji; Kimura, Toshiaki; Matsuda, Hiroshi; Sakai, Kunihiro; and Miyazaki, Toshihiko, 5,004,671, Cl. 430-286.000.

Kinczel, Peter; Balazs, Laszlo ; and Sajo, Gabor, to Tungsram Reszvenytarsasag (Tungsram RT). Luminescent material, especially for application in mercury vapor gas discharge light sources, and mercury vapor gas discharge light source. 5,004,948, Cl. 313-486.000.

Kinetic Concepts, Inc.: *See—*
Vrzalik, John H., 5,003,654, Cl. 5-453.000.

King, Brian T. Valve duration and lift variator for internal combustion engines. 5,003,939, Cl. 123-90.160.

King, James L., to A. O. Smith Corporation. Power and control chamber for dynamoelectric machines. 5,004,942, Cl. 310-89.000.

King, Murray P.: *See—*
Hafelfinger, Werner; Sholder, Jason A.; King, Murray P.; and Duncan, James L., 5,003,975, Cl. 128-419.0PG.

King, Philip N., to Hewlett Packard Company. Method and apparatus for providing thermodynamic protection of a driver circuit used in an in-circuit tester. 5,005,008, Cl. 340-653.000.

Kingsbury, William D.: *See—*
Boehm, Jeffrey C.; Hecht, Sidney M.; Holden, Kenneth G.; Johnson, Randall K.; and Kingsbury, William D., 5,004,758, Cl. 514-283.000.

Kino, Gordon S.; and Mansfield, Scott M., to Leland Stanford Junior University, The Board of Trustees of the. Near field and solid immersion optical microscope. 5,004,307, Cl. 350-1.200.

Kinoshita, Kiyoshi: *See—*
Tamura, Yukio; Kinoshita, Kiyoshi; Uwaji, Tetsuo; and Mizuno, Takashi, 5,004,352, Cl. 366-343.000.

Kinoshita, Masaaki: *See—*
Kaneko, Shozo; and Kinoshita, Masaaki, 5,003,891, Cl. 110-341.000.

Kinoshita, Yasunori: *See—*
Nakashima, Yoshihiro; and Kinoshita, Yasunori, 5,005,134, Cl. 364-474.010.

Kinser, Jason M.: *See—*
Caulfield, H. John; Hester, Charles F.; Kinser, Jason M.; and Shamir, Joseph, 5,004,309, Cl. 350-3.680.

Kipp, Robert M., to Shell Oil Company. Tendon bottom connector for a tension leg platform. 5,004,272, Cl. 285-24.000.

Kircher, Klaus: *See—*
Meier, Helmut-Martin; Kircher, Klaus; and Berg, Klaus, 5,004,569, Cl. 260-410.600.

Kirin Beer Kabushiki Kaisha: *See—*
Fukuchi, Hiroyuki, 5,004,909, Cl. 250-223.00B.

Kirschbaum, Robert: *See—*
Waagen, Geert N.; Bastiaansen, Cornelis W. M.; and Kirschbaum, Robert, 5,004,778, Cl. 524-474.000.

Kirschner, Kraig A. Adjustable load bolt adapter bracket assembly. 5,004,193, Cl. 248-59.000.

Kirschner, Roger S.: *See—*
McCracken, William L.; McDonald, Paul D.; and Kirschner, Roger S., 5,004,310, Cl. 350-6.800.

Kishi, Ikuo: *See—*
Ogawa, Osamu; Kishi, Ikuo; Tahara, Yoshiyuki; and Sugita, Masanori, 5,004,756, Cl. 514-655.000.

Kishi, Katsunobu, to Nitto Kohki Co., Ltd. Chamfering machine. 5,004,385, Cl. 409-180.000.

Kishida, Akira: *See—*
Kenmochi, Kazuhito; Yarita, Ikuo; Fukuhara, Akihiko; Komatu, Tomio; and Kishida, Akira, 5,003,804, Cl. 72-39.000.

Kishida, Hajime: *See—*
Yoshida, Takeo; and Kishida, Hajime, 5,004,154, Cl. 239-96.000.

Kishida, Naoto: *See—*
Shibazaki, Toshiji; Okano, Masaru; Kishida, Naoto; Ozaki, Yoshihiro; and Iyama, Kunihiko, 5,004,996, Cl. 338-36.000.

Kishigami, Junjiro: *See—*
Nishino, Yoshinori; and Kishigami, Junjiro, 5,004,895, Cl. 219-528.000.

Kishimoto, Junichi: *See—*
Hayashi, Minoru; Kobari, Koichi; Sato, Kimiharu; and Kishimoto, Junichi, 5,004,586, Cl. 422-164.000.

Kissel, Charles L., to Union Oil Company of California. Latex/sol or gel systems. 5,004,562, Cl. 252-518.000.

Kissel, Charles L., to Union Oil Company of California. Antistatic textile compositions and sol/gel/polymer compositions. 5,004,563, Cl. 252-518.000.

Kistner, Kenneth J., to Specified Equipment Systems Company, Inc. Method and apparatus for applying single of multicomponent materials. 5,004,159, Cl. 239-337.000.

Kitamura, Koichi; Mimura, Hidenori; Yamamoto, Kazuo; and Ohta, Yasumitsu, to Nippon Steel Corporation. Contact type image sensor device with specific capacitance ratio. 5,004,903, Cl. 250-208.100.

Kitamura, Takayuki: *See—*
Okazaki, Kakuma; and Kitamura, Takayuki, 5,003,736, Cl. 52-108.000.

Kito, Shozo: *See—*
Imai, Hajime; Kito, Shozo; Harada, Shoichi; Yokoyama, Yoshinobu; Nakamura, Syuzi; Miyoshi, Shigetoshi; and Muramatsu, Tadao, 5,003,799, Cl. 70-247.000.

Kitsuda, Sakae. Safety cylinder cap. 5,004,117, Cl. 220-85.00P.

Kleinerman, Marcos. Remote measurement of physical variables with fiber optic systems - methods, materials and devices. 5,004,913, Cl. 250-227.210.

Klem, Charles D.: *See*—
Dankwort, Rudolph C.; and Klem, Charles D., 5,004,911, Cl. 250-227.210.

Klemarczyk, Philip T.; and Okamoto, Yoshihisa, to Loctite Corporation. Aromatic vinyl ether compounds and compositions, and method of making the same. 5,004,842, Cl. 568-640.000.

Klesius, Konrad. Plastic closure for a plastic container. 5,004,126, Cl. 222-153.000.

Kleven, Lawrence P.; Agranat, Edward A.; Crisafulli, Jerry; Robinson, Hugh; Smith, David J.; Wiseley, Thomas; Fortier, Richard C.; Johnson, Severne; and Menzin, Marvin, to Texas Instruments Incorporated. Current sensing relay. 5,004,954, Cl. 315-106.000.

Kliewer, Justin J. Pipe thread protector device. 5,004,016, Cl. 138-96.00T.

Kline, Joseph M. Scalers for periodontal use. 5,004,419, Cl. 433-143.000.

Klingel, Rainhard: *See*—
Deller, Klaus; Ettlinger, Manfred; Klingel, Rainhard; and Krause, Helmfried, 5,004,719, Cl. 502-242.000.

Klotzer, Sieghart: *See*—
Meckl, Heinz; Klotzer, Sieghart; Wolff, Erich; and Haseler, Helmut, 5,004,676, Cl. 430-398.000.

Kluft, Cornelis, to Nederlandse Centrale Organisatie voor Teegepast-Natturwentenschappelijk Orderzoel. 100KDa protein from blood which binds to and inhibits the activity of plasminogen activators. 5,004,802, Cl. 530-380.000.

Kluitmans, Johannes T. M.; and Tjassens, Hindrik, to U.S. Philips Corp. Laser diode module. 5,005,178, Cl. 372-36.000.

Knabenhans, Fritz: *See*—
Waeber, Rene; Demuth, Robert; Knabenhans, Fritz; and Bachmann, Othmar, 5,003,670, Cl. 19-66.0CC.

Knape, Richard S.: *See*—
Stumpf, William E.; Carlson, Casey L.; Knape, Richard S.; and Bessinger, Walter L., 5,004,202, Cl. 248-243.000.

Knape & Vogt Manufacturing Company: *See*—
Bessinger, Walter L., 5,004,201, Cl. 248-243.000.
Stumpf, William E.; Carlson, Casey L.; Knape, Richard S.; and Bessinger, Walter L., 5,004,202, Cl. 248-243.000.

Knapp, Richard H.: *See*—
Mallard, Bobby J.; Knapp, Richard H.; Roper, W. J.; and Harrison, Daniel R., 5,004,071, Cl. 182-3.000.

Knauf, Peter: *See*—
Born, Dieter; Knauf, Peter; and Retelsdorf, Hans-Joachim, 5,004,886, Cl. 219-76.140.

Kniewske, Reinhard: *See*—
Krause, Frank; and Kniewske, Reinhard, 5,004,767, Cl. 524-30.000.

Knop, Bernhard: *See*—
Loth, Helmut; Helpenstein, Klaus; Podola, Tore; and Knop, Bernhard, 5,004,769, Cl. 524-43.000.

Knox, Wayne H.: *See*—
Glass, Alastair M.; Knox, Wayne H.; and Nolte, David D., 5,004,325, Cl. 350-354.000.

Knutsen, Neil W., to Allen-Bradley Company. Industrial controller with decompilable user program. 5,005,152, Cl. 364-900.000.

Kobari, Koichi: *See*—
Hayashi, Minoru; Kobari, Koichi; Sato, Kimiharu; and Kishimoto, Junichi, 5,004,586, Cl. 422-164.000.

Kobari, Yuji: *See*—
Imaseki, Takashi; and Kobari, Yuji, 5,005,131, Cl. 364-426.020.

Kobashi, Yasuhiro; and Irikura, Tsutomu, to Matsushita Electric Industrial Co., Ltd. Solid electrolytic capacitor. 5,005,107, Cl. 361-540.000.

Kobayashi, Atsushi; Suzuki, Takashi; and Kosugi, Yasuhiko, to Seiko Epson Corporation. Image forming apparatus. 5,005,043, Cl. 355-27.000.

Kobayashi, Hiroaki: *See*—
Yamakawa, Tsutomu; and Kobayashi, Hiroaki, 5,004,904, Cl. 250-207.000.

Kobayashi, Jiro, to Nissan Motor Co., Ltd. Fuel check valve assembly for fuel tank. 5,004,002, Cl. 137-39.000.

Kobayashi, Kazuhiro: *See*—
Koboshi, Shigeharu; Kobayashi, Kazuhiro; Goto, Nobutaka; Kurematsu, Masayuki; and Takabayashi, Naoki, 5,004,522, Cl. 159-47.003.

Kobayashi, Keiichi: *See*—
Tsukamoto, Akihiro; and Kobayashi, Keiichi, 5,005,013, Cl. 340-825.440.

Kobayashi, Kyoji; and Furuya, Takeo, to Jidosha Denki Kogyo K.K. Seat belt apparatus. 5,004,178, Cl. 242-107.000.

Kobayashi, Masao. Production method of forming solid state food material completely wrapped and sealed in a clayish state food material. 5,004,619, Cl. 426-297.000.

Kobayashi, Masato; Yamaguchi, Yoh-Ichi; Sugawara, Minoru; and Yamashiro, Kazuhide, to Hoya Corporation. X-ray mask and method of manufacturing an X-ray mask. 5,005,075, Cl. 378-35.000.

Kobayashi, Tomoya: *See*—
Abe, Kunihiro; Sakamoto, Masanori; and Kobayashi, Tomoya, 5,005,129, Cl. 364-424.030.

Kobayashi, Toshio; Uchikawa, Fusaoki; Nomura, Kenji; Morita, Masao; and Yokoyama, Shouichi, to Mitsubishi Denki Kabushiki Kaisha. Process for producing a superconductor of an oxide system from acetylacetonates. 5,004,720, Cl. 505-1.000.

Kobayashi, Yoshiharu: *See*—
Sato, Shuichi; and Kobayashi, Yoshiharu, 5,003,901, Cl. 112-316.000.

Koblitz, Francis F.; O'Shea, Thomas M.; Stoner, Beverly A.; and Yula, Joseph J., to AMP Incorporated. Electrical connector containing adipic acid polyester sealant composition. 5,004,869, Cl. 174-84.00C.

Koboshi, Shigeharu; Kobayashi, Kazuhiro; Goto, Nobutaka; Kurematsu, Masayuki; and Takabayashi, Naoki, to Konica Corporation. Method of treating photographic process waste liquor through concentration by evaporation. 5,004,522, Cl. 159-47.003.

Kodaira, Takanori: *See*—
Ogawa, Yukio; Hirohata, Michio; Kodaira, Takanori; and Miyawaki, Makoto, 5,005,038, Cl. 354-400.000.

Kodama, Katuhiko: *See*—
Haraguchi, Hiroshi; Tamura, Hiroshi; Kodama, Katuhiko; and Kondo, Toshio, 5,003,955, Cl. 123-489.000.

Koehler, Juergen, to Konvekta GmbH. Installation for heating, ventilation or air-conditioning of a long-distance bus. 5,004,150, Cl. 237-12.30A.

Koenig, Rudolf: *See*—
Unterforsthuber, Karl; and Koenig, Rudolf, 5,003,887, Cl. 102-531.000.

Koerner, Gotz; and Schaefer, Dietmar, to Th. Goldschmidt AG. Polyoxyalkylene-polysiloxane block copolymers as demulsifiers for water-containing oil. 5,004,559, Cl. 252-345.000.

Koester, Vaughn J.: *See*—
Hanson, Charles M.; Koester, Vaughn J.; and Fallstrom, Robert D., 5,005,213, Cl. 455-617.000.

Koezuka, Tetsuo: *See*—
Kakinoki, Yoshikazu; Nakashima, Masato; Koezuka, Tetsuo; Hiraoka, Noriyuki; Tsukahara, Hiroyuki; Suto, Yoshinori; Oshima, Yoshitaka; and Hashinami, Shinji, 5,004,929, Cl. 250-561.000.

Kofman, Anatoly; and Kavitsky, Avraham. Vehicle locking device. 5,003,798, Cl. 70-238.000.

Koga, Yukihiro; and Koyama, Yukio, to Mitsubishi Jukogyo Kabushiki Kaisha. Apparatus for bonding adhesive rubber tape to both edges of a steel cord fabric. 5,004,516, Cl. 156-463.000.

Koh-I-Noor Rapidograph, Inc.: *See*—
Felgentreu, Peter, 5,004,365, Cl. 401-258.000.

Kohler, Burkhard: *See*—
Zecher, Wilfried; El-Sayed, Aziz; Haese, Wilfried; Kohler, Burkhard; and Meyer, Rolf-Volker, 5,004,795, Cl. 528-73.000.

Kohler Co.: *See*—
Churchill, Jonathan D.; and Volmary, William T., 5,003,948, Cl. 123-352.000.

Kohls, Dennis E.; and Moser, Francis M., to Reece Construction Company, Inc. Pelletized sulfur concrete and method of preparing same. 5,004,799, Cl. 528-389.000.

Kohno, Teruhisa: *See*—
Yamada, Shinji; Kohno, Teruhisa; and Takata, Koji, 5,004,301, Cl. 303-115.000.

Kohno, Yoshihide: *See*—
Kadota, Kuninobu; Kohno, Yoshihide; and Koseki, Hiroyuki, 5,004,031, Cl. 152-538.000.

Koike, Hiroyuki: *See*—
Muraki, Yoshiya; and Koike, Hiroyuki, 5,003,984, Cl. 128-710.000.

Koike, Mikio: *See*—
Hara, Kazumasa; Sano, Yasuro; Koike, Mikio; and Nishijima, Mitsuru, 5,003,896, Cl. 112-121.110.

Koizumi, Takashi: *See*—
Miyata, Yukihide; Ishizaka, Hideo; Saito, Yoshio; and Koizumi, Takashi, 5,004,582, Cl. 422-56.000.

Kojima, Kunio: *See*—
Sakamoto, Noriaki; Maeda, Shigemi; Yamanaka, Toshihiro; Deguchi, Toshihisa; Horie, Nobuyuki; Yamaguchi, Takeshi; and Kojima, Kunio, 5,005,164, Cl. 369-48.000.

Komai, Takeshi: *See*—
Matsuyama, Kazuo; Sugiura, Takashi; and Komai, Takeshi, 5,004,780, Cl. 525-27.000.

Komatsu, Norimasa; and Miyazaki, Asashi, to Alps Electric Co., Ltd. Mode changeover mechanism with flat cam surface for a tape player. 5,005,094, Cl. 360-105.000.

Komatu, Tomio: *See*—
Kenmochi, Kazuhito; Yarita, Ikuo; Fukuhara, Akihiko; Komatu, Tomio; and Kishida, Akira, 5,003,804, Cl. 72-39.000.

Komurasaki, Satosi, to Mitsubishi Denki Kabushiki Kaisha. Control apparatus for internal combustion engine. 5,003,951, Cl. 123-425.000.

Konczol, Kalman: *See*—
Jekkel nee Bokany, Antonia; Altrecht, Karoly; Ambrus, Gabor; Lang, Tibor; Szabo, Istvan M.; Ilkoy, Eva; Konczol, Kalman; Moravcsik, Imre; Hantos, Gabor; Simonovits, Emilia; Lengyel nee Szemenyei, Zsuzsanna; Vida, Zsuzesanna; and Csajagi, Eva, 5,004,695, Cl. 435-253.100.

Kondo, Asaji: *See*—
Arai, Fuminori; and Kondo, Asaji, 5,004,685, Cl. 435-25.000.

Kondo, Syunichi; and Watarai, Syu, to Fuji Photo Film Co., Ltd. Electroconducting semiconductor and binder or binder precursor coated in a subbing layer. 5,004,641, Cl. 428-208.000.

Kondo, Toshio: *See*—
Haraguchi, Hiroshi; Tamura, Hiroshi; Kodama, Katuhiko; and Kondo, Toshio, 5,003,955, Cl. 123-489.000.

Kondo, Yukihito, to Jeol, Ltd. Transmission electron microscope. 5,004,919, Cl. 250-311.000.

Konica Corporation: *See*—
Kawada, Sunao; Hashimoto, Takayoshi; Itoh, Toyotsugu; and Koyanagi, Makoto, 5,003,851, Cl. 82-1.110.
Koboshi, Shigeharu; Kobayashi, Kazuhiro; Goto, Nobutaka; Kurematsu, Masayuki; and Takabayashi, Naoki, 5,004,522, Cl. 159-47.003.
Okui, Susumu, 5,004,223, Cl. 271-275.000.
Tomono, Makoto; Tarumi, Noriyoshi; and Sato, Masayuki, 5,004,666, Cl. 430-110.000.
Yagi, Toshihiko; Kumashiro, Kenji; and Takiguchi, Hideki, 5,004,680, Cl. 430-603.000.
Yamada, Taketoshi; Habu, Takeshi; and Takamuki, Yasuhiko, 5,004,669, Cl. 430-264.000.
Kono, Kazuo: *See*—
Umehara, Keiichi; Hirose, Hisashi; and Kono, Kazuo, 5,004,915, Cl. 250-231.140.
Konvekta GmbH: *See*—
Koehler, Juergen, 5,004,150, Cl. 237-12.30A.
Koopmann, Gary H., to Bridgestone/Firestone, Inc. Suspension simulator. 5,003,819, Cl. 73-146.000.
Kope, Harry H.: *See*—
Fortin, J. Andre ; Ogilvie, Kelvin K.; Tsantrizos, Youla S.; and Kope, Harry H., 5,004,754, Cl. 514-570.000.
Korczynski, Jacek M.; and Stack, Thomas J., to Cooper Industries, Inc. Push-to-trip high-amp circuit breaker. 5,004,994, Cl. 337-66.000.
Kordts, Jurgen: *See*—
Martens, Gerhard; Kordts, Jurgen; and Weidinger, Georg, 5,004,912, Cl. 250-227.140.
Korea Institute of Science and Technology: *See*—
Oh, Myung H.; Lee, Kyung J.; Chung, In J.; Lee, Nam Y.; and Kim, Myung S., 5,004,573, Cl. 264-61.000.
Koschak, Francis L.; and Sarno, Felicisimo S., to Star-kist Foods, Inc. Semi-moist pet food having free gravy and process for preparation thereof. 5,004,624, Cl. 426-623.000.
Koseki, Hiroyuki: *See*—
Kadota, Kuninobu; Kohno, Yoshihide; and Koseki, Hiroyuki, 5,004,031, Cl. 152-538.000.
Koshikawa, Nobuo; and Inoue, Masahiro, to Kabushiki Kaisha Machida Seisakusho. Endoscope and jig for processing signal conductors of endoscope. 5,003,964, Cl. 128-4.000.
Koslov, Joshua L.: *See*—
Zdepski, Joel W.; and Koslov, Joshua L., 5,005,082, Cl. 358-174.000.
Kosugi, Yasuhiko: *See*—
Kobayashi, Atsushi; Suzuki, Takashi; and Kosugi, Yasuhiko, 5,005,043, Cl. 355-27.000.
Koteff, Walter B.: *See*—
Cooke, Kevin K.; Dewitt, John R.; Galinis, Paul J.; and Koteff, Walter B., 5,004,866, Cl. 174-35.0GC.
Kotobuki Seiyaku Company Limited: *See*—
Tomiyama, Tsuyoshi; Tomiyama, Akira; and Kubota, Koichi, 5,004,750, Cl. 514-382.000.
Koutaka, Yoshirou, to Alps Electric Co., Ltd. Click-type push button switch with improved leaf spring. 5,004,880, Cl. 200-521.000.
Kovach, John S.: *See*—
Ames, Matthew M.; and Kovach, John S., 5,004,593, Cl. 424-10.000.
Kovalev, Valentin D.: *See*—
Juschenko, Konstantin A.; Varenchuk, Pavel A.; Kovalev, Valentin D.; Chvertko, Anatoly I.; Privalov, Nikolai T.; and Kuzmenko, Vladimir G., 5,004,885, Cl. 219-73.200.
Kowalczyk, Thaddeus. Filter assembly for protecting motor vehicle occupants from pollution. 5,004,487, Cl. 55-269.000.
Kowalski, David J.: *See*—
Fong, Dodd W.; and Kowalski, David J., 5,004,786, Cl. 525-344.000.
Koyama, Takeshi: *See*—
Murayama, Akihiro; and Koyama, Takeshi, 5,004,935, Cl. 307-353.000.
Koyama, Yukio: *See*—
Koga, Yukihiro; and Koyama, Yukio, 5,004,516, Cl. 156-463.000.
Koyanagi, Makoto: *See*—
Kawada, Sunao; Hashimoto, Takayoshi; Itoh, Toyotsugu; and Koyanagi, Makoto, 5,003,851, Cl. 82-1.110.
Koyo Seiko Co., Ltd.: *See*—
Ida, Tomoyasu; Nohara, Makoto; and Seo, Nobuyuki, 5,004,980, Cl. 324-166.000.
Kozaki, Tetsuji; Ishikawa, Hiroshi; Yasui, Hideaki; Shimamoto, Mamoru; Hibino, Katsuhiko; and Suzuki, Motoshi, to Nippondenso Co., Ltd. Position control device and automotive suspension system employing same. 5,004,264, Cl. 280-707.000.
Kozuka, Nobuhiko, to Mita Industrial Co., Ltd. Image-forming machine having a process assembly comprising two independently movable units. 5,005,053, Cl. 355-245.000.
Kragten, Ubaldus F.: *See*—
Baur, Henricus A. C.; and Kragten, Ubaldus F., 5,004,837, Cl. 568-342.000.
Kramasz, Kenneth J.: *See*—
Edelman, William; Constantinou, Dennis; Stefanovski, Miles; Jan, Yuh L.; Fahlen, Theodore S.; Hansen, Ronald L.; and Kramasz, Kenneth J., 5,005,180, Cl. 372-57.000.
Kramer, Ralf: *See*—
Schmidt, Konrad; and Kramer, Ralf, 5,005,016, Cl. 341-142.000.
Kraper, Wayne. Shopping basket accessory. 5,004,252, Cl. 280-33.992.
Krasicki, Walter, Jr.: *See*—
Krasicki, Walter, Sr.; and Krasicki, Walter, Jr., 5,003,857, Cl. 84-266.000.
Krasicki, Walter, Sr.; and Krasicki, Walter, Jr., to W & W Musical Instrument Company. Spindle for harp. 5,003,857, Cl. 84-266.000.
Krause, Duane K.: *See*—
Timmins, Lawrence J.; and Krause, Duane K., 5,004,102, Cl. 206-386.000.
Krause, Frank; and Kniewske, Reinhard, to Cerestar Holding B.V. Polymer compositions. 5,004,767, Cl. 524-30.000.
Krause, Helmfried: *See*—
Deller, Klaus; Ettlinger, Manfred; Klingel, Rainhard; and Krause, Helmfried, 5,004,719, Cl. 502-242.000.
Krause, William R.: *See*—
Azer, Samir N.; Salman, Naser N.; and Krause, William R., 5,003,969, Cl. 128-87.00R.
Kreitmair, Xaver: *See*—
Vesely, Ivan; and Kreitmair, Xaver, 5,003,680, Cl. 29-227.000.
Kremer, Ingo: *See*—
Grosch, Peter; Haas, Gerhard; and Kremer, Ingo, 5,004,249, Cl. 277-207.00R.
Krenzer, Eberhard, to Barmag AG. Method and apparatus for processing a textured yarn. 5,003,677, Cl. 28-220.000.
Kreyenborg Verwaltungen und Beteiligungen KG: *See*—
Stude, Rolf-Rudiger; and Wilken-Trenkamp, Ludger, 5,004,414, Cl. 425-185.000.
Kricheldorf, Hans-Rytger; Delius, Ulrich; and Wehrmann, Rolf, to Bayer Aktiengesellschaft. Aromatic polyethers containing keto groups in side chains. 5,004,836, Cl. 568-333.000.
Krief, Alain; and Dumont, Willy, to Roussel Uclaf. Novel process for preparing semi-caronic aldehydes. 5,004,840, Cl. 568-486.000.
Krishen, Kumar; Shaw, Scott W.; and deFigueiredo, Rui J. P., to United States of America, Administrator, the National Aeronautics and Space Administration. Method and apparatus for sensor fusion. 5,005,147, Cl. 364-578.000.
Krjukov, Georgy M.: *See*—
Goikhman, Yakov A.; Krjukov, Georgy M.; Onotsky, Melis I.; Sorokin, Georgy M.; Filatov, Alexei V.; Tsarapkin, Viktor V.; Yakimov, Vadim P.; Smirnov, Gennady A.; Nikiforov, Ivan I.; Burdukovsky, Alexandr I.; Daibov, Sergei V.; and Kurdjukov, Alexandr S., 5,004,056, Cl. 175-293.000.
Krohn, Christine E., to Exxon Production Research Company. Continuity logging using differenced signal detection. 5,005,159, Cl. 367-57.000.
Kroisenbrunner, Walter, to Boehler Ges. m.b.H. Preliminary material for the production of composite material parts and method of making. 5,004,653, Cl. 428-615.000.
Kronfeld, David S.: *See*—
Chalupa, William; Kronfeld, David S.; Schneider, Paul L.; and Sklan, David, 5,004,728, Cl. 514-12.000.
Krounbi, Mohamad T.; and Wang, Po-Kang, to International Business Machines Corporation. Magnetoresistive read transducer having hard magnetic shunt bias. 5,005,096, Cl. 360-113.000.
Kruckel, Peter: *See*—
Huttner, Gerhard; Kruckel, Peter; and Mock, Gerhard, 5,004,363, Cl. 401-75.000.
Kruger, James B.: *See*—
Tullis, Barclay J.; and Kruger, James B., 5,004,340, Cl. 356-243.000.
Krukovsky, Yuri. Simulated observation flight apparatus. 5,004,225, Cl. 272-18.000.
Krupnicki, Theodore A. Splicing device for fluid-cooled electric cables. 5,004,865, Cl. 174-15.700.
Kubota, Kazuhiro: *See*—
Sunagawa, Masao; Kubota, Kazuhiro; Ishii, Yoshitaro; and Satoh, Susumu, 5,003,663, Cl. 15-366.000.
Kubota, Koichi: *See*—
Tomiyama, Tsuyoshi; Tomiyama, Akira; and Kubota, Koichi, 5,004,750, Cl. 514-382.000.
Kucerija, Zoran. Gas expander based power plant system. 5,003,782, Cl. 60-648.000.
Kuchel, Michael, to Carl-Zeiss-Stiftung. Method of examining an optical component. 5,004,346, Cl. 356-360.000.
Kudo, Shigeru: *See*—
Hara, Yasuhiro; Inoue, Mitsuhiro; Baba, Hideo; Okazaki, Tadashi; and Kudo, Shigeru, 5,004,089, Cl. 192-107.00M.
Kugimiya, Shuzo; Fukumochi, Yoji; Nakamura, Ichiko; Hirai, Tokuyuki; and Suzuki, Hitoshi, to Sharp Kabushiki Kaisha. System including means to translate only selected portions of an input sentence and means to translate selected portions according to distinct rules. 5,005,127, Cl. 364-419.000.
Kulik, Conrad J.: *See*—
Lee, Sunggyu; Ashok, Sawant; and Kulik, Conrad J., 5,004,717, Cl. 502-50.000.
Kumashiro, Kenji: *See*—
Yagi, Toshihiko; Kumashiro, Kenji; and Takiguchi, Hideki, 5,004,680, Cl. 430-603.000.
Kume, Hidehiro: *See*—
Mitsumori, Koji; and Kume, Hidehiro, 5,005,162, Cl. 369-44.120.
Kun, Zoltan K.; Cresswell, Michael W.; and Hopkins, Richard H., to Westinghouse Electric Corp. Thin film electroluminescent edge emitter structure on a silcon substrate. 5,004,956, Cl. 315-169.300.
Kunde, Klaus: *See*—
Leins, Eberhard; and Kunde, Klaus, 5,003,793, Cl. 66-9.00B.
Kung, Roland; and Widmer, Hanspeter, to Zellweger Telecommunications AG. Process and apparatus for the transmission of selective

addresses and/or emergency messages in shortwave radio networks. 5,005,209, Cl. 455-32.000.

Kung, Viola T., to Molecular Devices Corporation. Nitrocellulose filtration to remove proteins from polynucleotides. 5,004,806, Cl. 530-415.000.

Kuo, George; Masiarz, Frank; Truett, Martha; and Valenzuela, Pablo, to Nordisk Gentofte. Method and composition for preparation of factor VIIIC. 5,004,804, Cl. 530-387.000.

Kurdjukov, Alexandr S.: *See*—
Goikhman, Yakov A.; Krjukov, Georgy M.; Onotsky, Melis I.; Sorokin, Georgy M.; Filatov, Alexei V.; Tsarapkin, Viktor V.; Yakimov, Vadim P.; Smirnov, Gennady A.; Nikiforov, Ivan I.; Burdukovsky, Alexandr I.; Daibov, Sergei V.; and Kurdjukov, Alexandr S., 5,004,056, Cl. 175-293.000.

Kurdys, Gregory D.: *See*—
Cadwallader, George W.; Highfill, Louis A.; Kurdys, Gregory D.; and Turiglatto, Richard S., 5,004,589, Cl. 423-315.000.

Kurematsu, Masayuki: *See*—
Koboshi, Shigeharu; Kobayashi, Kazuhiro; Goto, Nobutaka; Kurematsu, Masayuki; and Takabayashi, Naoki, 5,004,522, Cl. 159-47.003.

Kuribara, Motoaki; and Fujino, Ikuo, to Mitsuba Electric Mfg. Co., Ltd. Rotation device with a sealing plate. 5,004,090, Cl. 192-112.000.

Kurimoto, Kazunori, to Tokai Chemical Industries, Ltd. Method of producing skin tube for annular foam product, and assembly of the skin tube and core structure. 5,004,572, Cl. 264-46.600.

Kuriyama, Minoru, to Ube Industries, Ltd. Degassing apparatus for mold. 5,004,038, Cl. 164-305.000.

Kuriyama, Shigemi, to Mitsubishi Jukogyo Kabushiki Kaisha. Regulated D.C.-D.C. power converter having multiple D.C. outputs. 5,005,112, Cl. 363-21.000.

Kurkowski, Hal, to Dallas Semiconductor Corporation. Interleaved arbitration scheme for interfacing parallel and serial ports to a parallel system port. 5,005,151, Cl. 364-900.000.

Kurono, Yoshikazu: *See*—
Yokoe, Masaaki; Kurono, Yoshikazu; and Hayashi, Koji, 5,003,897, Cl. 112-121.120.

Kuroyanagi, Masatoshi; Suzuki, Masahiko; Matsui, Kazuma; Imaeda, Makoto; Nagai, Kouzi; and Ito, Yoshiaki, to Nippondenso Co., Ltd. Radial piston pump. 5,004,406, Cl. 417-273.000.

Kurst, Frederick L.: *See*—
Serrell, Robert; Smith, J. Lamar; and Kurst, Frederick L., 5,004,896, Cl. 235-437.000.

Kusano, Hiromi: *See*—
Nagai, Takao; and Kusano, Hiromi, 5,004,320, Cl. 350-276.00R.

Kuskova, Natalya I.: *See*—
Sizonenko, Olga N.; Maxutov, Rafkhat A.; Maljushevsky, Pavel P.; Gorovenko, Georgy G.; Sokolov, Alexei V.; Lyapis, Diana N.; Schekin, Vladimir I.; and Kuskova, Natalya I., 5,004,050, Cl. 166-248.000.

Kuzmenko, Vladimir G.: *See*—
Juschenko, Konstantin A.; Varenchuk, Pavel A.; Kovalev, Valentin D.; Chvertko, Anatoly I.; Privalov, Nikolai T.; and Kuzmenko, Vladimir G., 5,004,885, Cl. 219-73.200.

Kvita, Vratislav, to Ciba-Geigy Corporation. Substituted α-pyrones and process for their preparation. 5,004,814, Cl. 549-294.000.

Kwiatek, Jack: *See*—
Hanes, Ronnie M.; and Kwiatek, Jack, 5,004,568, Cl. 260-410.000.

Kwon, Oh-Hyun; Jang, Taek-Yong; Shin, Jung-Hyun; and Choi, Won-Taek, to Samsung Electronics Co., Ltd. Method of manufacturing folded capacitors in semiconductor and folded capacitors fabricated thereby. 5,005,103, Cl. 361-313.000.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Yasuzawa, Toru; Nakanishi, Satoshi; Murakata, Chikara; Kase, Hiroshi; Sano, Hiroshi; and Yamada, Koji, 5,004,833, Cl. 536-18.200.

La Mina Ltd.: *See*—
Guirguis, Raouf A., 5,003,988, Cl. 128-771.000.

Labate, Micheal D. Method for producing ultra clean steel. 5,004,495, Cl. 75-10.220.

Labayle, Denis: *See*—
Boiteau, Richard; Labayle, Denis; and Tenaillon, Alain, 5,003,657, Cl. 15-104.330.

Labinal Components and Systems, Inc.: *See*—
Lindeman, Richard J., 5,004,427, Cl. 439-101.000.

Laboratoire Roger Bellon: *See*—
Antoine, Michel; Barreau, Michel; Desconclois, Jean-Francois; Girard, Philippe; and Picaut, Guy, 5,004,745, Cl. 514-254.000.

Laboure, Bernard: *See*—
Schegerin, Robert; Laboure, Bernard; and Standish, Robert, 5,003,770, Cl. 60-226.200.

Lafferty, James G. Seeder clutch for tramlines. 5,003,894, Cl. 111-178.000.

Lafferty, Theodore B., Sr. Engine air intake shutoff apparatus. 5,003,943, Cl. 123-198.00D.

LaGrange, Donald E.: *See*—
Herold, Stanley J.; Howard, Charles D.; and LaGrange, Donald E., 5,003,881, Cl. 102-337.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Reale, Serge, 5,003,783, Cl. 62-51.200.
Rotman, Frederic; Rancon, Yannick; Queille, Philippe; and Olivier, Michel, 5,004,489, Cl. 65-32.200.

Laitram Corporation, The: *See*—
Lapeyre, James M.; Weber, Peter G.; and Greve, Christopher G., 5,004,095, Cl. 198-660.000.
Lapeyre, James M.; Weber, Peter G.; and Greve, Christopher G., 5,004,096, Cl. 198-666.000.

Lakatos, Tamas; Molnar, Jozsef; and Madarasz, Endre, to Magyar Tudomanyos Akademia Atommag Kutato Intezete. Signal processing method for nuclear spectrometers. 5,005,146, Cl. 364-573.000.

Lal, Brij B.; and Eltoukhy, Atef H., to HMT Technology Corporation. High-coercivity thin-film recording medium and method. 5,004,652, Cl. 428-611.000.

Lalor, William F.: *See*—
Wilkes, Lambert H.; Mehner, Martin; and Lalor, William F., 5,003,669, Cl. 19-49.000.

Lam, Juan F.; and Hasenberg, Thomas C., to Hughes Aircraft Company. Method and apparatus for Q-switching a laser. 5,005,176, Cl. 372-10.000.

Lam, William Y.; and Liesen, Gregory P., to Ethyl Corporation. Fuel compositions containing sulfur-bridged phenolic antioxidants. 5,004,481, Cl. 44-435.000.

Lamont, Robert G.: *See*—
Hill, Kenneth O.; Johnson, Derwyn C.; and Lamont, Robert G., 5,004,316, Cl. 350-96.150.

Lamonte, Ronald R.: *See*—
Vicari, Richard; Costanza, John R.; Lamonte, Ronald R.; and Miano, Ralph M., 5,004,796, Cl. 528-179.000.

Landa, Benzion; Hochman, Haim; and Yacoub, Naseem, to Spectrum Sciences B.V. Dispersion apparatus. 5,004,165, Cl. 241-21.000.

Landis, Robert A., to Mead Corporation, The. Two-stage method and apparatus for glossing a developer sheet. 5,004,891, Cl. 219-388.000.

Landrevie, Jacques: *See*—
Biggio, Alain; and Landrevie, Jacques, 5,004,897, Cl. 235-441.000.

Lang, Gerard: *See*—
Richard, Herve; Leduc, Madeleine; Forestier, Serge; and Lang, Gerard, 5,004,594, Cl. 424-47.000.

Lang, Tibor: *See*—
Jekkel nee Bokany, Antonia; Albrecht, Karoly; Ambrus, Gabor; Lang, Tibor; Szabo, Istvan M.; Ilkoy, Eva; Konczol, Kalman; Moravcsik, Imre; Hantos, Gabor; Simonovits, Emilia; Lengyel nee Szemenyei, Zsuzsanna; Vida, Zsuzesanna; and Csajagi, Eva, 5,004,695, Cl. 435-253.100.

Langford, Stephen R.; Stone, James R.; and Bagley, William C., to Cardinal Scale Manufacturing Company. Weigh scale using multiple digital load cells. 5,004,058, Cl. 177-25.130.

Langlitz, Karlheinz: *See*—
Ackermann, Wilhelm; Langlitz, Karlheinz; and Schmitz, Gunter, 5,003,835, Cl. 74-411.000.

Lanham, Bryan: *See*—
Adams, James; Gobel, Richard; and Lanham, Bryan, 5,004,028, Cl. 144-176.000.

Lanser, Mike L.; and Elenbaas, Tony J., to Prince Corporation. Visor torque control. 5,004,289, Cl. 296-97.120.

Lanxide Technology Company, LP: *See*—
Becker, Kurt J., 5,004,036, Cl. 164-97.000.
Burke, John T.; and Newkirk, Marc S., 5,004,035, Cl. 164-97.000.
Claar, Terry D.; Johnson, William B.; and Rapp, Robert A., 5,004,714, Cl. 501-134.000.
Park, Eugene S.; and Aghajanian, Michael K., 5,004,034, Cl. 164-97.000.

Lanza, Richard C.; and Votano, Joseph R., to Expert Image Systems, Inc. Digital readout system for radiographic imaging. 5,005,195, Cl. 378-62.000.

Lanza, Richard C.; and Votano, Joseph R., to Expert Image Systems, Inc. Limb positioning and calibration apparatus for radiographic imaging. 5,005,196, Cl. 378-207.000.

Lapeyre, James M.; Weber, Peter G.; and Greve, Christopher G., to Laitram Corporation, The. Apparatus for use in variable operating temperatures. 5,004,095, Cl. 198-660.000.

Lapeyre, James M.; Weber, Peter G.; and Greve, Christopher G., to Laitram Corporation, The. Screw conveyor coupling apparatus. 5,004,096, Cl. 198-666.000.

Lapp, Roger H.; and Paraska, Theodore F., to Johns Hopkins University, The. Overmoded waveguide elbow and fabrication process. 5,003,687, Cl. 29-600.000.

Larminie, James, to Johnson Matthey Public Limited Company. Apparatus for demonstrating and studying the operation of a fuel cell. 5,004,424, Cl. 434-301.000.

Larson, William L., to Ramtron Corporation. Multilayer electrodes for integrated circuit capacitors. 5,005,102, Cl. 361-313.000.

Lasley, Daniel G., to Summagraphics Corporation. Digitizer tablet with pressure stylus. 5,004,872, Cl. 178-18.000.

Latassa, Frank M.; and Leyh, Thomas O., to North American Philips Corporation. Fluorescent lamp with grounded electrode guard. 5,004,949, Cl. 313-492.000.

Lau, Jurgen: *See*—
Rohrscheid, Freimund; Siegemund, Gunter; and Lau, Jurgen, 5,004,797, Cl. 528-206.000.

Lauber, Peter, to Conprinta Ltd. Flexographic printing machine, especially for flexographic blank printing. 5,003,873, Cl. 101-219.000.

Laukaitis, Joseph F.: *See*—
Donivan, Lawrence J.; and Laukaitis, Joseph F., 5,005,050, Cl. 355-208.000.

Launer, Russell C. Work platform apparatus for roofs. 5,004,072, Cl. 182-45.000.

Lavas, Bernard R.: *See*—
Dull, Raymond P.; Lavas, Bernard R.; and Baxter, William D., 5,003,740, Cl. 52-239.000.

Law, Kock-Yee; and Bailey, F. Courtney, to Xerox Corporation. Photoconductive member having symmetrical and unsymmetrical squaraine compositions. 5,004,661, Cl. 430-59.000.

Lawn-Wright, Inc.: *See*—
Velke, James D.; and Wright, William R., 5,004,251, Cl. 280-32.700.

Lawrie, Warwick W. Alignment sleeve for hand tool having a universal joint. 5,003,849, Cl. 81-184.000.

Lazarof, Sargon. Dental implant and method of using same. 5,004,421, Cl. 433-173.000.

Le, Hiep M.: *See*—
Wasmer, William D.; Gillespie, Peter J.; Lippmann, James G.; and Le, Hiep M., 5,005,069, Cl. 357-72.000.

Le, Toby: *See*—
Shannon, Leland K.; Gentry, Ted L.; and Le, Toby, 5,003,811, Cl. 73-12.000.

Leath, Robert P. Janitorial utility belt for carrying spray bottles, gloves, dusters, and cleaning towels. 5,004,136, Cl. 224-253.000.

Leavens, James E.: *See*—
Eller, Joe C.; Leavens, James E.; and Wyatt, Charles H., 5,004,483, Cl. 55-20.000.

Lederle (Japan) Ltd.: *See*—
Ogawa, Osamu; Kishi, Ikuo; Tahara, Yoshiyuki; and Sugita, Masanori, 5,004,756, Cl. 514-655.000.

Leduc, Madeleine: *See*—
Richard, Herve; Leduc, Madeleine; Forestier, Serge; and Lang, Gerard, 5,004,594, Cl. 424-47.000.

Lee Colortran, Inc.: *See*—
Cunningham, David W., 5,004,957, Cl. 315-199.000.

Lee, Dong J.: *See*—
Yeo, Jong K.; Kim, Chung S.; Lee, Dong J.; and Jang, Sung H., 5,004,774, Cl. 524-262.000.

Lee, Guo-shuh J.; Garces, Juan M.; Maj, Joseph J.; and Rocke, Stephen C., to Dow Chemical Company, The. Alkylation of aromatic compounds to alkylates enriched in the linear-substituted isomers. 5,004,841, Cl. 568-678.000.

Lee, Jaeduck, to Saehan Media Corporation. Winding core for magnetic tape adapted for stacking. 5,004,175, Cl. 242-68.500.

Lee, Kap J.: *See*—
Niki, Motohiro; Niki, Etsuko; Kidachi, Misako; Kidachi, Atsushi; Niki, Mieko; Lee, Kap J.; and Lee, Yun, 5,003,922, Cl. 119-15.000.

Lee, Kyung J.: *See*—
Oh, Myung H.; Lee, Kyung J.; Chung, In J.; Lee, Nam Y.; and Kim, Myung S., 5,004,573, Cl. 264-61.000.

Lee, Min Ki, to Goldstar Co., Ltd. Method and circuit for controlling power level in the electromagnetic induction cooker. 5,004,881, Cl. 219-10.770.

Lee, Nam Y.: *See*—
Oh, Myung H.; Lee, Kyung J.; Chung, In J.; Lee, Nam Y.; and Kim, Myung S., 5,004,573, Cl. 264-61.000.

Lee, Richard J.; Smith, Barbara A.; Theys, Robert G.; Theys, Robert A.; and Murphy, Judy A., to RJ Lee Group, Inc. Method of preparing membrane filters for transmission electron microscopy. 5,004,920, Cl. 250-304.000.

Lee, Seung-Woo, to Samsung Electron Devices Co., Ltd. Plasma display panel arranged with auxiliary electrode. 5,004,950, Cl. 313-582.000.

Lee, Sheau-Jiung, to Acer Incorporated. MOS analog NOR amplifier and current source therefor. 5,004,938, Cl. 307-448.000.

Lee, Shin-Ye. Drying system. 5,003,705, Cl. 34-54.000.

Lee, Sunggyu; Ashok, Sawant; and Kulik, Conrad J., to Electric Power Research Institute, Inc. Process for in-situ regeneration of aged methanol catalysts. 5,004,717, Cl. 502-50.000.

Lee, Ted: *See*—
Ayers, Robert C.; and Lee, Ted, 5,004,259, Cl. 280-304.100.

Lee, Tony T.: *See*—
Arthurs, Edward; Goodman, Matthew S.; Kim, Chong K.; and Lee, Tony T., 5,005,167, Cl. 370-4.000.

Lee, Yuan-Ho. Basement piles and basement construction method associated therewith. 5,004,375, Cl. 405-230.000.

Lee, Yun: *See*—
Niki, Motohiro; Niki, Etsuko; Kidachi, Misako; Kidachi, Atsushi; Niki, Mieko; Lee, Kap J.; and Lee, Yun, 5,003,922, Cl. 119-15.000.

Leenhouts, Frans; and Schadt, Martin, to Hoffmann-La Roche Inc. Liquid crystal display. 5,004,324, Cl. 350-347.00R.

Le Fur, Joel: *See*—
Ikes, Jacques; Le Fur, Joel; and Nugues, Pierre, 5,004,952, Cl. 315-3.500.

Le Gauyer, Philippe, to Valeo Thermique Moteur. Vehicle radiator with clamping fixture to reduce deformation during brazing and method of making. 5,004,045, Cl. 165-149.000.

Legler, John G.; Folkerth, Harold E.; Flora, David D.; and Hile, Barry L., to Shopsmith, Inc. Biscuit joiner. 5,004,027, Cl. 144-136.00R.

Leigh, Steven, to Phares Pharmaceutical Research NV. Pro-liposome compositions. 5,004,611, Cl. 424-450.000.

Leins, Eberhard; and Kunde, Klaus, to Terrot Strickmaschinen GmbH. Card wheel for a knitting machine for making knit goods with combed-in fibers. 5,003,793, Cl. 66-9.00B.

Leise, Walter F., Jr., to E.R. Squibb & Sons. Convex adapter for ostomy device. 5,004,464, Cl. 604-338.000.

Leistritz, Hans K. Self-suctioning piston engines. 5,003,775, Cl. 60-313.000.

Leland Stanford Junior University, The Board of Trustees of the: *See*—
Kino, Gordon S.; and Mansfield, Scott M., 5,004,307, Cl. 350-1.200.

Lemberger, Heinz, to Bayerische Motoren Werke AG. Arrangement for apportioning the idling air of internal-combustion engines. 5,003,947, Cl. 123-339.000.

Lemelson, Dorothy: *See*—
Lemelson, Jerome H.; and Lemelson, Dorothy, 5,004,442, Cl. 446-302.000.

Lemelson, Jerome H.; and Lemelson, Dorothy. Educational toys. 5,004,442, Cl. 446-302.000.

Lenders, Emanuel J. W. M.: *See*—
Verhulst, Antonius G. H.; Bruinink, Jacob; and Lenders, Emanuel J. W. M., 5,004,322, Cl. 350-320.000.

Lenert, Steven A.; and Berkley, Robert D. Game bird decoys. 5,003,718, Cl. 43-3.000.

Lengyel nee Szemenyei, Zsuzsanna: *See*—
Jekkel nee Bokany, Antonia; Albrecht, Karoly; Ambrus, Gabor; Lang, Tibor; Szabo, Istvan M.; Ilkoy, Eva; Konczol, Kalman; Moravcsik, Imre; Hantos, Gabor; Simonovits, Emilia; Lengyel nee Szemenyei, Zsuzsanna; Vida, Zsuzesanna; and Csajagi, Eva, 5,004,695, Cl. 435-253.100.

Lenon Envionmental Inc.: *See*—
Crawford, Paul M.; Campbell, Herbert W.; Myers, Michael J.; and Siverns, Steven L., 5,003,814, Cl. 73-59.000.

Lenoski, Daniel E., to Tandem Computers Incorporated. Method and apparatus for modifying micro-instructions using a macro-instruction pipeline. 5,005,118, Cl. 364-200.000.

Leonard, Robert E., to Kerr-McGee Chemical Corporation. Apparatus for soot removal from exhaust gas. 5,003,774, Cl. 60-275.000.

Leone, David A.: *See*—
Moody, G. Lawrence; Leone, David A.; and Bell, Mark E., 5,004,875, Cl. 200-400.000.

Leonhart, Charles J., to nuArc Company, Inc. Graphic arts exposure device. 5,005,048, Cl. 355-93.000.

Leopold Kostal GmbH & Co. KG: *See*—
Singor, Aydin, 5,004,868, Cl. 174-76.000.

Levi, Amram: *See*—
Adany, Shalom; and Levi, Amram, 5,003,713, Cl. 40-113.000.

Lew, Hyok S. Digital pressure sensor. 5,003,825, Cl. 73-704.000.

Lewis Gallob Toys, Inc.: *See*—
Coleman, Paula M.; and Luecke, Mark T., 5,004,445, Cl. 446-478.000.

Leyh, Thomas O.: *See*—
Latassa, Frank M.; and Leyh, Thomas O., 5,004,949, Cl. 313-492.000.

L'Heureux, Ghislain. Acoustically insulating electrical box. 5,004,115, Cl. 220-3.300.

Liang, Jeng An. Instrument for indicating an angular position of an object. 5,003,700, Cl. 33-401.000.

Liang, Jiuh-Ming: *See*—
Liu, Ru-Shi; Huang, Yao-Tsung; Chu, Jau-Jier; and Liang, Jiuh-Ming, 5,004,723, Cl. 505-1.000.

Liao, Chuen-Rong. Sanitary tearing towel. 5,004,637, Cl. 428-43.000.

Liasons Electroniques-Mecaniques: *See*—
Cattaneo, Pierr; and Gudel, Claude, 5,004,974, Cl. 324-117.00R.

Libbey-Owens-Ford Co.: *See*—
Borer, John W.; Skiliter, William J.; and Conner, Lowell J., 5,004,492, Cl. 65-289.000.

Lichtman, Philip R.: *See*—
Halem, Stephen; and Lichtman, Philip R., 5,004,158, Cl. 239-310.000.

Liesen, Gregory P.: *See*—
Lam, William Y.; and Liesen, Gregory P., 5,004,481, Cl. 44-435.000.

Light, David R.; and Rastetter, William H., to Genetech, Inc. Ascorbic acid intermediates and process enzymes. 5,004,690, Cl. 435-138.000.

Liles, Steve L.: *See*—
Dickie, Gerald M.; Liles, Steve L.; and Woldvedt, Alan H., 5,004,372, Cl. 405-63.000.

Lim, Gnian C., to Amada Company, Limited. Method of evaluating quality of a laser beam in a laser processing machine. 5,004,890, Cl. 219-121.830.

Lin, David Y.: *See*—
Barger, Paul T.; Barder, Timothy J.; Lin, David Y.; and Hobbs, Simon H., 5,004,853, Cl. 585-481.000.

Lin, Jian C.: *See*—
Yu, Meng W.; Su, Shihuai; Chen, Yue Z.; Zheng, Ticheng; Ji, Kebin; Ling, Shou R.; Lin, Jian C.; Deng, Jianhui; and Zhang, Kunwu, 5,004,510, Cl. 148-146.000.

Lin, Peir-Kuen. Built-up type air-conditioning cushion assembly. 5,004,294, Cl. 297-180.000.

Lind, Charles F. Portable exercise device. 5,004,229, Cl. 272-127.000.

Linde Aktiengesellschaft: *See*—
Durr, Dieter, 5,003,731, Cl. 51-418.000.

Lindeman, Richard J., to Labinal Components and Systems, Inc. Electrical connectors. 5,004,427, Cl. 439-101.000.

Linder, James C.; and McKenzie, Jeffrey J., to Fluoroware, Inc. Position indicating control valve. 5,004,011, Cl. 137-556.000.

Lindroth, Thomas A.: *See*—
Allen, Floyd L.; Best, Glen H.; and Lindroth, Thomas A., 5,004,506, Cl. 106-729.000.

Lindsay, Joshua: *See*—
Thanos, William N.; Peterson, Bruce R.; Moon, William G.; Lindsay, Joshua; and Stone, Thomas R., 5,005,089, Cl. 360-77.080.

Ling, Shou R.: *See*—
Yu, Meng W.; Su, Shihuai; Chen, Yue Z.; Zheng, Ticheng; Ji, Kebin; Ling, Shou R.; Lin, Jian C.; Deng, Jianhui; and Zhang, Kunwu, 5,004,510, Cl. 148-146.000.

Link, Rainer; and Nuding, Wolfgang, to Isotopenforschung Dr. Sauerwein GmbH. Process for monitoring a device for automatically detecting and evaluating surface cracks. 5,003,831, Cl. 73-865.900.

Lipchak, John B.; Oblak, Tod A.; Bednar, Fred H.; Ciaramitaro, William; Hughes, Francis R.; Smith, John R.; and Gisoni, Gregory A., to Westinghouse Electric Corp. Smart sensor system for diagnostic monitoring. 5,005,142, Cl. 364-550.000.

Lippmann, James G.: *See*—
Wasmer, William D.; Gillespie, Peter J.; Lippmann, James G.; and Le, Hiep M., 5,005,069, Cl. 357-72.000.

Lipscomb, Dennis E.; Wilhelm, Gary L.; Perna, Barbara G.; and Guenthner, Waldemar G., to Cooper Industries, Inc. Compound action anvil snips. 5,003,695, Cl. 30-193.000.

Liptay-Wagner, Nicholas: *See*—
Pryor, Timothy R.; Hageniers, Omer L.; Pastorius, Walter J.; Liptay-Wagner, Nicholas; and Clarke, Donald A., 5,004,339, Cl. 356-241.000.

Little, Barry M.: *See*—
Hirschmann, Robert P.; Beard, William Q., Jr.; Mainz, Eric L.; Smith, Earl B.; and Little, Barry M., 5,004,849, Cl. 570-224.000.

Little, Roger W. Threading insert. 5,004,379, Cl. 407-113.000.

Litton Systems, Inc.: *See*—
Tazartes, Daniel A.; Mark, John G.; and Mathews, Anthony, 5,004,344, Cl. 356-350.000.

Litz, Lawrence M.; Weise, Mark K.; and Haid, David A., to Union Carbide Industrial Gases Technology Corporation. Liquid level control in gas-liquid mixing operations. 5,004,571, Cl. 261-91.000.

Liu, Paul S.; Sunkara, Sai P.; and Bowlin, Terry L., to Merrell Dow Pharmaceuticals Inc. Anti-retroviral castanospermine esters. 5,004,746, Cl. 514-299.000.

Liu, Ru-Shi; Huang, Yao-Tsung; Chu, Jau-Jier; and Liang, Jiuh-Ming, to Industrial Technology Research Institute. Preparation of superconducting epitaxial film using the method of liquid-phase epitaxial growth. 5,004,723, Cl. 505-1.000.

Lo, Ying C. Fuse assembly for car. 5,004,995, Cl. 337-266.000.

Loch, Eugene W.; Ball, David D.; and Mack, George F., to ITT Corporation. Self-venting container. 5,004,129, Cl. 220-366.000.

Lochhead, Robert Y.; Castaneda, Janet Y.; and Hemker, Wilfred J., to B. F. Goodrich Company, The. Stable and quick-breaking topical skin compositions. 5,004,598, Cl. 424-59.000.

Lockhart, John C., Jr.; Hartman, Standish C.; Meuron, Bruce R.; and Lyons, Joseph B., Jr., to United States of America, Navy. Air-surface-missile data link system. 5,004,185, Cl. 224-3.140.

Loctite Corporation: *See*—
Klemarczyk, Philip T.; and Okamoto, Yoshihisa, 5,004,842, Cl. 568-640.000.

Loffel, Rudi: *See*—
Fritz, Hans-Gerhard; and Loffel, Rudi, 5,005,194, Cl. 378-53.000.

Loftfield, Richard E.: *See*—
Dong, Dennis F.; and Loftfield, Richard E., 5,004,626, Cl. 427-58.000.

Logan, Robert M.: *See*—
Binder, Thomas P.; and Logan, Robert M., 5,004,507, Cl. 127-58.000.

Logan, Stephen A.: *See*—
Montierth, Garry L.; Logan, Stephen A.; and Scott, Raymond J., 5,004,190, Cl. 246-428.000.

Loge, Olaf: *See*—
Raduechel, Bernd; Skuballa, Werner; Vorbrueggen, Helmut; Loge, Olaf; and Schilliner, Ekkehard, 5,004,752, Cl. 514-530.000.

Lohman, Oskar R. Coupling for a bicycle. 5,004,083, Cl. 192-5.000.

Loladze, Teimuraz N.; Batiashvili, Boris I.; Mamulashvili, Gennady L.; Butskhrikidze, David S.; Grdzelishvili, Georgy J.; and Markevich, Jury I., to Vsesojuzny Naucho-Issledovatelsky i Proektno-Konstruktorsky Institut Atomnogo Energeticheskogo Machinostroenia USSR. Machine for abrasive treatment. 5,003,728, Cl. 51-165.800.

Lomac Corporation: *See*—
McIntyre, Jonothon M. W., 5,004,195, Cl. 248-99.000.

Lonon, Edward M. Gloves with utility attachments. 5,003,637, Cl. 2-160.000.

Loo, Billy W.; and Goulding, Frederick S., to United States of America, Energy. Method and apparatus for measuring lung density by Compton backscattering. 5,003,980, Cl. 128-653.00R.

Loos, Rolf: *See*—
Wahl, Hans-Peter; Schlueter, Rudolf; Kaettlitz, Wolfgang; and Loos, Rolf, 5,004,545, Cl. 210-510.100.

Loppnow, Duane. Multipurpose bicycle tool. 5,003,656, Cl. 7-169.000.

Lord Corporation: *See*—
Ivers, Douglas E.; and Nobles, Charles M., 5,004,079, Cl. 188-282.000.

L'Oreal: *See*—
Philippe, Michel; and Sebag, Henri, 5,004,730, Cl. 514-029.000.
Richard, Herve; Leduc, Madeleine; Forestier, Serge; and Lang, Gerard, 5,004,594, Cl. 424-47.000.

Lotan, Noah: *See*—
Grunfeld, Hay; Lotan, Noah; and Sideman, Samuel, 5,004,547, Cl. 210-635.000.

Loth, Helmut; Helpenstein, Klaus; Podola, Tore; and Knop, Bernhard, to Henkel Kommanditgesellschaft auf Aktien. Use of nonionic cellulose ethers in joint-sealing materials and coating materials. 5,004,769, Cl. 524-43.000.

Louk, James R.: *See*—
Wilson, William B.; DiPietro, Matthew; Neace, Richard K.; Dethier, Vincent B.; Hauss, Raymond G.; and Louk, James R., 5,005,036, Cl. 354-322.000.

Lovera, Patrick: *See*—
Kawahara, Hideo; Sakata, Nobuhiro; Coulon, Jean-Claude; and Lovera, Patrick, 5,004,503, Cl. 106-287.180.

Lovik, Craig J. Balloon decorative devices, methods and kits. 5,004,633, Cl. 428-9.000.

Low, C. David: *See*—
Schmidt, Robert J.; Haizmann, Robert S.; Ford, Mark R.; Low, C. David; and Adams, Frank H., 5,004,859, Cl. 585-741.000.

LRS, Inc.: *See*—
McGarvey, David C.; and Buffalini, Jerry E., 5,004,632, Cl. 427-410.000.

LSI Logic Corporation: *See*—
Ruetz, Peter A., 5,005,120, Cl. 364-200.000.

Lucas Industries public limited company: *See*—
Brearley, Malcolm; and Moseley, Richard B., 5,004,299, Cl. 303-15.000.
Brearley, Malcolm; and Moseley, Richard B., 5,004,300, Cl. 303-15.000.

Lucky, Ltd.: *See*—
Yeo, Jong K.; Kim, Chung S.; Lee, Dong J.; and Jang, Sung H., 5,004,774, Cl. 524-262.000.

Luecke, Mark T.: *See*—
Coleman, Paula M.; and Luecke, Mark T., 5,004,445, Cl. 446-478.000.

Luhn & Pulvermacher GmbH & Co.: *See*—
Schulte, Helmut, 5,004,213, Cl. 266-116.000.

Lui, Paul S.: *See*—
Wong, John J.; and Lui, Paul S., 5,004,232, Cl. 273-435.000.

Luk Lamellen und Kupplungsbau GmbH: *See*—
Huber, Lothar, 5,004,087, Cl. 192-89.00B.

Lumac BV: *See*—
Simpson, William J.; and Hammond, John R. M., 5,004,684, Cl. 435-8.000.

Lumitex, Inc.: *See*—
Pristash, David J.; and Parker, Jeffery R., 5,005,108, Cl. 362-31.000.

Lumonics Inc.: *See*—
Beckwith, Paul H., 5,005,177, Cl. 372-34.000.

Lundblad, James A.: *See*—
Perlman, Stephen G.; Okun, Jerome M.; Palevich, John H.; and Lundblad, James A., 5,005,011, Cl. 340-728.000.

Lunka, Harold A.; and Marlowe, Christian P., to Storage Technology Corporation. Autoloader magazine for tape cartridges and method therefor. 5,004,393, Cl. 414-331.000.

Lutron Electronics Co., Inc.: *See*—
Yuhasz, Stephen J., 5,005,211, Cl. 455-603.000.

Lyapis, Diana N.: *See*—
Sizonenko, Olga N.; Maxutov, Rafkhat A.; Maljushevsky, Pavel P.; Gorovenko, Georgy G.; Sokolov, Alexei V.; Lyapis, Diana N.; Schekin, Vladimir I.; and Kuskova, Natalya I., 5,004,050, Cl. 166-248.000.

Lyons, Joseph B., Jr.: *See*—
Lockhart, John C., Jr.; Hartman, Standish C.; Meuron, Bruce R.; and Lyons, Joseph B., Jr., 5,004,185, Cl. 224-3.140.

Lyons, Nicholas; Baxter, William R. S.; Woodward, Adrian M.; and Clarke, Roger W., to Alcan International Limited. Filter membrane with flexure. 5,004,542, Cl. 210-356.000.

Lysinger, Mark A.: *See*—
McClure, David C.; and Lysinger, Mark A., 5,005,158, Cl. 365-200.000.

Lythgoe, David J.: *See*—
Ashton, Michael J.; Bridge, Andrew W.; Chambers, Robert K.; Dron, Donald I.; Fenton, Garry; Harris, Neil V.; Lythgoe, David J.; McFarlane, Ian M.; Newton, Christopher G.; Riddell, David; Smith, Christopher; Stuttle, Keith A. J.; and Toft, Malcolm P., 5,004,747, Cl. 514-309.000.

Macdonald, Andrew J.: *See*—
Dehn, Rudolph A.; and Macdonald, Andrew J., 5,005,015, Cl. 340-962.000.

Mace, Everitt W.; Sickler, Janet; and Srinivasan, Varadarajan, to International Business Machines Corporation. Thermally dissipated soldering flux. 5,004,508, Cl. 148-22.000.

Machida, Junji: *See*—
Ohtani, Junji; Anno, Masahiro; Sano, Eiichi; Machida, Junji; and Masuda, Fumio, 5,004,665, Cl. 430-106.600.

MacIsaac, William L. Vehicle suspension system. 5,004,257, Cl. 280-112.200.

Mack, George F.: *See*—
Loch, Eugene W.; Ball, David D.; and Mack, George F., 5,004,129, Cl. 220-366.000.

MacLennan, Charles; Hamilton, Douglas D.; and Palfy, Robert M. Felling head. 5,004,026, Cl. 144-3.00D.

Macronix, Inc.: *See*—
Wong, John J.; and Lui, Paul S., 5,004,232, Cl. 273-435.000.

Madarasz, Endre: *See*—
Lakatos, Tamas; Molnar, Jozsef; and Madarasz, Endre, 5,005,146, Cl. 364-573.000.

Maddox, Ricky R. Holder for a stuffed toy animal for use with a floral arrangement. 5,003,725, Cl. 47-39.000.

Maeda, Kiyoto: *See*—
Mori, Tatsuya; Ohsumi, Tadashi; Nakamura, Shigeo; Maeda, Kiyoto; Nishida, Sumio; and Takano, Hirotaka, 5,004,816, Cl. 549-462.000.

Maeda, Mitsuru: *See*—
Sase, Toshitsugu; Matsuda, Michiaki; Yanagisawa, Kiyoshi; and Maeda, Mitsuru, 5,004,068, Cl. 181-276.000.

Maeda, Satoshi; and Sawada, Shizuo, to Kabushiki Kaisha Toshiba. Method for manufacturing a semiconductor device having a phospho silicate glass layer as an interlayer insulating layer. 5,004,704, Cl. 437-195.000.

Maeda, Shigemi: *See—*
Sakamoto, Noriaki; Maeda, Shigemi; Yamanaka, Toshihiro; Deguchi, Toshihisa; Horie, Nobuyuki; Yamaguchi, Takeshi; and Kojima, Kunio, 5,005,164, Cl. 369-48.000.
Yamanaka, Toshihiro; Maeda, Shigemi; and Horie, Nobuyuki, 5,005,165, Cl. 369-58.000.

Maejima, Hideo; and Masuda, Ikuro, to Hitachi, Ltd. Data processor integrated on a semiconductor substrate. 5,005,153, Cl. 364-900.000.

Magic Plastics: *See—*
Sarno, Russell J., 5,004,210, Cl. 251-279.000.

Magnan, Bruno: *See—*
Faccioli, Giovanni; De Bastiani, Basilio M.; Magnan, Bruno; and Soffiatti, Renzo, 5,004,501, Cl. 106-35.000.

Magnavox Government and Industrial Electronics Company: *See—*
Erickson, Frederick L.; and Richeson, William E., Jr., 5,003,938, Cl. 123-90.140.

Magnon, Gary D.: *See—*
Seymour, Raymond K.; Hart, Marshall B.; Magnon, Gary D.; von Kannewurff, Michael C.; and Doughty, Dennis J., 5,004,878, Cl. 200-144.00R.

Magome, Nobutaka, to Nikon Corporation. Alignment device. 5,004,348, Cl. 356-401.000.

Magyar Tudomanyos Akademia Atommag Kutato Intezete: *See—*
Lakatos, Tamas; Molnar, Jozsef; and Madarasz, Endre, 5,005,146, Cl. 364-573.000.

Maher, John H. System for transferring workpieces through a series of work stations. 5,003,808, Cl. 72-405.000.

Mahil, Mahinder S.; and Cruden, John M., to Harlow Chemical Company Limited. Adhesive compositions and self-adhesive sheet materials. 5,004,768, Cl. 524-30.000.

Mahler, Leo M. Adjustable water-level flushing apparatus. 5,004,462, Cl. 4-325.000.

Mahon, Paul F.: *See—*
Jerusik, Russell J.; and Mahon, Paul F., 5,004,749, Cl. 514-372.000.

Maiellano, Joseph C., Jr.: *See—*
Bowen, Robert F.; Dudley, Kenneth W.; and Maiellano, Joseph C., Jr., 5,004,617, Cl. 426-233.000.

Mainz, Eric L.: *See—*
Hirschmann, Robert P.; Beard, William Q., Jr.; Mainz, Eric L.; Smith, Earl B.; and Little, Barry M., 5,004,849, Cl. 570-224.000.

Maj, Joseph J.: *See—*
Lee, Guo-shuh J.; Garces, Juan M.; Maj, Joseph J.; and Rocke, Stephen C., 5,004,841, Cl. 568-678.000.

Majeti, Satyanarayana; Guay, Christopher B.; and Crisanti, Mark M., to Procter & Gamble Company, The. Oral compositions comprising stannous flouride and stannous gluconate. 5,004,597, Cl. 424-52.000.

Major, Leroy B.: *See—*
Piccone, Dante E.; McIntyre, James E., deceased; and Major, Leroy B., 5,005,065, Cl. 357-38.000.

Makhija, Surender K.: *See—*
Marino, Joseph A.; Makhija, Surender K.; Taghikhani, Majid; and Puetz, Peter A., 5,004,979, Cl. 324-160.000.

Makino, Toru, to Yamaha Corporation. Method of making a lead frame by embossing, grinding and etching. 5,004,521, Cl. 156-645.000.

Makino, Yutaka: *See—*
Izumi, Yasuo; Ishimoto, Kazumi; and Makino, Yutaka, 5,003,692, Cl. 29-834.000.

Makita Electric Works, Ltd.: *See—*
Fushiya, Fusao; Yokoyama, Yoshio; and Hara, Akihito, 5,004,140, Cl. 227-8.000.

Maljushevsky, Pavel P.: *See—*
Sizonenko, Olga N.; Maxutov, Rafkhat A.; Maljushevsky, Pavel P.; Gorovenko, Georgy G.; Sokolov, Alexei V.; Lyapis, Diana N.; Schekin, Vladimir I.; and Kuskova, Natalya I., 5,004,050, Cl. 166-248.000.

Mallard, Bobby J.; Knapp, Richard H.; Roper, W. J.; and Harrison, Daniel R., to Specialized Shipping Products, Ltd. Adaptor bracket. 5,004,071, Cl. 182-3.000.

Mamulashvili, Gennady L.: *See—*
Loladze, Teimuraz N.; Batiashvili, Boris I.; Mamulashvili, Gennady L.; Butskhrikidze, David S.; Grdzelishvili, Georgy J.; and Markevich, Jury I., 5,003,728, Cl. 51-165.800.

MAN Nutzfahrzeuge GmbH: *See—*
Vesely, Ivan; and Kreitmair, Xaver, 5,003,680, Cl. 29-227.000.

MAN Roland Druckmaschinen AG: *See—*
Franz, Karl-Heinz; Ochs, Heinrich; and Difflipp, Kurt, 5,003,871, Cl. 101-148.000.
Glunz, Wolfgang; and Rau, Gunnar, 5,003,889, Cl. 101-228.000.

Man Technologie Aktiengesellschaft: *See—*
Erber, Anton; Hoff, Heinz; Reuchlein, Gunter; Schaaf, Hanno; and Schiessl, Gerhard, 5,003,778, Cl. 60-517.000.

Manaka, Junji: *See—*
Yagawara, Shinji; Manaka, Junji; and Ohta, Wasaburo, 5,003,812, Cl. 73-31.060.

Manesty Machines Limited: *See—*
Stopforth, Douglas R., 5,004,413, Cl. 425-182.000.

Mann, Samuel J., to Inverness Corporation. Earpiercing cartridge assembly. 5,004,470, Cl. 606-188.000.

Mann, Samuel J., to Inverness Corporation. Sterile ear piercing assembly. 5,004,471, Cl. 606-188.000.

Manne, Liora G.: *See—*
Cohen, Samuel; and Manne, Liora G., 5,003,674, Cl. 28-109.000.

Mannesmann Aktiengesellschaft: *See—*
Ackermann, Wilhelm; Langlitz, Karlheinz; and Schmitz, Gunter, 5,003,835, Cl. 74-411.000.
Pleschiutschnigg, Fritz-Peter; Parschat, Lothar; Franzen, Hans U.; Pfluger, Manfred; and Glaser, Josef, 5,004,040, Cl. 164-453.000.

Mannesmann Rexroth GmbH: *See—*
Amrhein, Reinhard; Heid, Walter; and Muschong, Gunther, 5,004,015, Cl. 137-625.680.

Mansfield, Scott M.: *See—*
Kino, Gordon S.; and Mansfield, Scott M., 5,004,307, Cl. 350-1.200.

Manville Corporation: *See—*
Bainbridge, David W., 5,004,018, Cl. 138-149.000.

Manzini, S.p.A: *See—*
Sommi, Franco; and Arelli, Pier L., 5,004,621, Cl. 426-386.000.

Mar, Shih L. Seat assembly. 5,003,653, Cl. 5-449.000.

Mara S.R.L.: *See—*
Marchina, Luciano, 5,004,214, Cl. 267-64.120.

Marangone, Nereo: *See—*
Colli, Luigi; Badiali, Roberto; and Marangone, Nereo, 5,004,171, Cl. 242-35.60R.

Marchessault, Robert H.: *See—*
Fuller, Timothy J.; Marchessault, Robert H.; and Bluhm, Terry L., 5,004,664, Cl. 430-106.600.

Marchina, Luciano, to Mara S.R.L. Device for adjusting the backrest and/or the seat of chairs. 5,004,214, Cl. 267-64.120.

Margolin, Jed: *See—*
Behensky, Max L.; Moncrief, Rick L.; Margolin, Jed; and Mott, Stephanie J., 5,005,148, Cl. 364-578.000.

Marino, Joseph A.; Makhija, Surender K.; Taghikhani, Majid; and Puetz, Peter A., to Bear Automotive Service Equipment Company. Battery tach. 5,004,979, Cl. 324-160.000.

Mark, John G.: *See—*
Tazartes, Daniel A.; Mark, John G.; and Mathews, Anthony, 5,004,344, Cl. 356-350.000.

Markevich, Jury I.: *See—*
Loladze, Teimuraz N.; Batiashvili, Boris I.; Mamulashvili, Gennady L.; Butskhrikidze, David S.; Grdzelishvili, Georgy J.; and Markevich, Jury I., 5,003,728, Cl. 51-165.800.

Markow, Paul A.; Nolle, William; and Bell, Charles L., to Chrysler Corporation. Wye winding radial air-core gauge system. 5,004,976, Cl. 324-154.00R.

Marley Tile A.G.: *See—*
Quinnell, Geoffrey C., 5,003,732, Cl. 52-94.000.

Marlowe, Christian P.: *See—*
Lunka, Harold A.; and Marlowe, Christian P., 5,004,393, Cl. 414-331.000.

Marostica, Eugene J. Necktie device. 5,003,636, Cl. 2-145.000.

Mars, Suzanne P. Head support. 5,003,968, Cl. 128-87.00B.

Marsh, Edward K.: *See—*
DelGuidice, Henry L.; and Marsh, Edward K., 5,004,430, Cl. 439-350.000.

Marshall, Gary C., to Joy Technologies Inc. Conveyor belt. 5,004,098, Cl. 198-847.000.

Martel, Louis, Jr.: *See—*
Carlson, Harold L.; DeWitt, Michael D.; Martel, Louis, Jr.; Kelley, Larry W.; and Tayon, Jeffrey E., 5,004,077, Cl. 188-2.00D.

Martell, Ely A. Sprinkler system. 5,004,157, Cl. 239-205.000.

Martell, Gregg. Multiple use cultivating tool. 5,004,053, Cl. 172-375.000.

Martens, Gerhard; Kordts, Jurgen; and Weidinger, Georg, to U.S. Philips Corp. Fiber-optical pressure sensor with contacting lightwave conductors. 5,004,912, Cl. 250-227.140.

Martin, Felix: *See—*
Muller, Erich R.; Priwitzer, Gunther; and Martin, Felix, 5,003,834, Cl. 74-339.000.

Martin, Jeffrey J. Fluid mixing accessory. 5,004,353, Cl. 366-349.000.

Martin, Paul E.: *See—*
Wolf, Charles B.; Dighe, Shyam V.; Martin, Paul E.; Taylor, Raymond F., Jr.; and Melilli, William J., 5,004,888, Cl. 219-121.520.

Martin, Richard W., to McKay Australia Limited. Rail fastener applicator. 5,003,888, Cl. 104-17.002.

Martin, Robert C., to Texas Instruments Incorporated. Parallel module testing. 5,005,173, Cl. 371-22.600.

Martin, Yves; and Wickramasinghe, Hemantha K., to International Business Machines Corporation. Atomic photo-absorption force microscope. 5,003,815, Cl. 73-105.000.

Martucci, Roberto: *See—*
Previato, Mario; Barbieri, Silvio; and Martucci, Roberto, 5,004,431, Cl. 439-358.000.

Maruhashi, Keiji: *See—*
Tomura, Yoshihiro; Maruhashi, Keiji; and Ozawa, Nobuyuki, 5,004,364, Cl. 401-110.000.

Maschinenfabrik Rieter AG: *See—*
Graf, Felix; and Busenhart, Peter, 5,004,170, Cl. 242-18.00R.
Waeber, Rene; Demuth, Robert; Knabenhans, Fritz; and Bachmann, Othmar, 5,003,670, Cl. 19-66.0CC.

Mashita, Kentaro; Fujii, Takeshi; and Oomae, Tadayuki, to Sumitomo Chemical Company, Ltd. Thermoplastic resin composition. 5,004,782, Cl. 525-64.000.

Masiarz, Frank: *See—*
Kuo, George; Masiarz, Frank; Truett, Martha; and Valenzuela, Pablo, 5,004,804, Cl. 530-387.000.

Massachusetts Institute of Technology: *See—*
Buchwald, Stephen L.; and Grossman, Robert B., 5,004,820, Cl. 556-53.000.

Danheiser, Rick L.; and Nowick, James S., 5,004,815, Cl. 549-328.000.

Mast, Thomas R., to Compuadd Corporation. Personal computer expansion slot seal and method. 5,004,867, Cl. 174-35.0GC.

Masuda, Fumio: *See—*
Ohtani, Junji; Anno, Masahiro; Sano, Eiichi; Machida, Junji; and Masuda, Fumio, 5,004,665, Cl. 430-106.600.

Masuda, Hajime, to NEC Corporation. High speed programmable read on memory device formed by bipolar transistors. 5,005,154, Cl. 365-96.000.

Masuda, Ikuro: *See—*
Maejima, Hideo; and Masuda, Ikuro, 5,005,153, Cl. 364-900.000.

Matejka, Wolfgang A.: *See—*
Gut, Karl; Matejka, Wolfgang A.; Gysel, Walter; and Gerber, Urs, 5,003,880, Cl. 102-314.000.

Mathai, John, to Sherwin-Williams Company, The. Hydroxy-functional polyester diluents as additives in coating compositions. 5,004,828, Cl. 560-224.000.

Mathews, Anthony: *See—*
Tazartes, Daniel A.; Mark, John G.; and Mathews, Anthony, 5,004,344, Cl. 356-350.000.

Mathieu, Mark A.: *See—*
Morris, Carroll E., Jr.; Balliew, Robert E.; Mathieu, Mark A.; and Johnsrud, Darrell B., 5,004,978, Cl. 324-158.00R.

Mator AG: *See—*
Fabricus, Claus, 5,003,869, Cl. 99-453.000.

Matsuda, Hiroshi: *See—*
Nishimura, Yukuo; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Nakagiri, Takashi; Saito, Kenji; Kimura, Toshiaki; Matsuda, Hiroshi; Sakai, Kunihiro; and Miyazaki, Toshihiko, 5,004,671, Cl. 430-286.000.

Matsuda, Michiaki: *See—*
Sase, Toshitsugu; Matsuda, Michiaki; Yanagisawa, Kiyoshi; and Maeda, Mitsuru, 5,004,068, Cl. 181-276.000.

Matsui, Hiroshi; and Toda, Akitoshi, to Olympus Optical Co., Ltd. Focused point detecting optical system. 5,004,902, Cl. 250-201.800.

Matsui, Kazufumi, to Idemitsu Petrochemical Co., Ltd. Fastener and wrapping bag having the same. 5,004,356, Cl. 383-63.000.

Matsui, Kazuma: *See—*
Kuroyanagi, Masatoshi; Suzuki, Masahiko; Matsui, Kazuma; Imaeda, Makoto; Nagai, Kouzi; and Ito, Yoshiaki, 5,004,406, Cl. 417-273.000.

Matsui, Kezuo: *See—*
Matsuo, Yoshio; Nakano, Hirofumi; Kamiya, Masakuni; and Matsui, Kezuo, 5,004,580, Cl. 419-65.000.

Matsumoto, Hitoshi: *See—*
Satoh, Toshio; Niiro, Yasunori; Kakegawa, Hisao; and Matsumoto, Hitoshi, 5,004,742, Cl. 514-226.500.

Matsumoto, Katsuya: *See—*
Takahashi, Hiroaki; Okada, Haruo; Matsumoto, Katsuya; and Umino, Masuo, 5,004,546, Cl. 210-635.000.

Matsumoto, Kouichi: *See—*
Ohtuka, Nobuo; and Matsumoto, Kouichi, 5,005,113, Cl. 363-37.000.

Matsumoto, Ryozo. Wrapping method and apparatus. 5,003,752, Cl. 53-399.000.

Matsumoto, Shusaku: *See—*
Yada, Akira; and Matsumoto, Shusaku, 5,004,761, Cl. 522-3.000.

Matsumoto, Yukihiro; Yoshihara, Kenji; Kajiura, Tetsuya; Niizato, Tomonori; and Yamada, Noriyuki, to Honda Giken Kogyo Kabushiki Kaisha. Valve operating system for internal combustion engine. 5,003,937, Cl. 123-90.120.

Matsuo, Hirokazu; and Nagato, Hiroyasu, to Minolta Camera Kabushiki Kaisha. Copying apparatus provided with automatic document feeder. 5,005,055, Cl. 355-311.000.

Matsuo, Noritada: *See—*
Otaka, Ken; Matsuo, Noritada; Tsushima, Kazunori; and Yano, Toshihiko, 5,004,753, Cl. 514-531.000.

Matsuo, Yoshio; Nakano, Hirofumi; Kamiya, Masakuni; and Matsui, Kezuo, to Fuji Electrochemical Co. Ltd. Method and apparatus for packing permanent magnet powder. 5,004,580, Cl. 419-65.000.

Matsuoka, Seigou, to Matsushita Electric Industrial Co., Ltd. Magnetic head with a coil and core supporting bobbin. 5,005,097, Cl. 360-121.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Fukada, Tetsuji; Wakamiya, Masayuki; and Kainou, Kikuo, 5,003,824, Cl. 73-651.000.
Hakotani, Yasuhiko; Nakatani, Seiichi; Yuuhaku, Satoru; Nishimura, Tsutomu; and Ishida, Toru, 5,004,715, Cl. 501-136.000.
Izumi, Yasuo; Ishimoto, Kazumi; and Makino, Yutaka, 5,003,692, Cl. 29-834.000.
Kobashi, Yasuhiro; and Irikura, Tsutomu, 5,005,107, Cl. 361-540.000.
Matsuoka, Seigou, 5,005,097, Cl. 360-121.000.
Mitsugu, Teruyuki; and Umezawa, Norio, 5,003,836, Cl. 74-425.000.
Nakatani, Seiichi; Yuhaku, Satoru; Nishimura, Tsutomu; Terada, Yukio; and Baba, Yasuyuki, 5,004,640, Cl. 428-195.000.

Matsushita, Kouji, to Minolta Camera Kabushiki Kaisha. Copying machine with capacity to measure transparency of original. 5,005,049, Cl. 355-208.000.

Matsushita, Yoshiaki: *See—*
Samata, Shuichi; and Matsushita, Yoshiaki, 5,004,702, Cl. 437-57.000.

Matsuura, Atsushi: *See—*
Honda, Kazuo; Matsuura, Atsushi; and Sano, Hisanori, 5,004,951, Cl. 313-631.000.

Matsuura, Hideki: *See—*
Mizoguchi, Shoichi; and Matsuura, Hideki, 5,005,185, Cl. 375-15.000.

Matsuyama, Kazuo; Sugiura, Takashi; and Komai, Takeshi, to Nippon Oil and Fats Co., Ltd. Cyclic monoperoxyketal. 5,004,780, Cl. 525-27.000.

Matsuzawa, Soichiro: *See—*
Terada, Nobuhiro; Shimizu, Masataka; and Matsuzawa, Soichiro, 5,003,688, Cl. 29-603.000.

Maurice, Jacques; Fouque, Romain; and Auriol, Jean-Louis, to Societe Nationale Elf Aquitaine (Production). Catalytic process for removal of hydrogen sulfides from liquid sulfur. 5,004,591, Cl. 423-578.00R.

Maxson, Myron T., to Dow Corning Corporation. Method for extending the working life of organosiloxane compositions curable by a platinum catalyzed hydrosilation reaction. 5,004,792, Cl. 528-15.000.

Maxtor Corporation: *See—*
Wagner, J. Arthur, 5,005,095, Cl. 360-106.000.

Maxutov, Rafkhat A.: *See—*
Sizonenko, Olga N.; Maxutov, Rafkhat A.; Maljushevsky, Pavel P.; Gorovenko, Georgy G.; Sokolov, Alexei V.; Lyapis, Diana N.; Schekin, Vladimir I.; and Kuskova, Natalya I., 5,004,050, Cl. 166-248.000.

May & Baker Limited: *See—*
Ashton, Michael J.; Bridge, Andrew W.; Chambers, Robert K.; Dron, Donald I.; Fenton, Garry; Harris, Neil V.; Lythgoe, David J.; McFarlane, Ian M.; Newton, Christopher G.; Riddell, David; Smith, Christopher; Stuttle, Keith A. J.; and Toft, Malcolm P., 5,004,747, Cl. 514-309.000.

Mayer, Klaus, to VDO Adolf Schindling AG. Indicating instrument. 5,003,914, Cl. 116-332.000.

Mayo Foundation for Medical Education and Research: *See—*
Ames, Matthew M.; and Kovach, John S., 5,004,593, Cl. 424-10.000.

Mazda Motor Corporation: *See—*
Shibata, Masanori; Okimoto, Haruo; Akagi, Toshimichi; and Tashima, Seiji, 5,003,781, Cl. 60-600.000.

Mazzali, Stefano, to SGS-Thomson Microelectronics s.r.l. Tablecloth memory matrix with staggered EPROM cells. 5,005,060, Cl. 357-23.500.

Mazzotta, Joseph A., Sr. Dog garment with flea repelling means. 5,003,756, Cl. 54-79.000.

McBride, Stephen W., to H-C Industries, Inc. Tamper-indicating plastic closure. 5,004,112, Cl. 215-252.000.

McCarthy, Theresa A., to Minnesota Mining & Manufacturing Company. Internally delaminating tabbed innerseal for a container and method of applying. 5,004,111, Cl. 215-232.000.

McClure, David C.; and Lysinger, Mark A., to SGS-Thomson Microelectronics, Inc. Redundancy for serial memory. 5,005,158, Cl. 365-200.000.

McConnell, Bernard E. Hand traction wrap. 5,003,967, Cl. 128-77.000.

McConnell, Pat M.: *See—*
Sullivan, Harold W.; and McConnell, Pat M., 5,004,399, Cl. 414-729.000.

McCracken, William L.; McDonald, Paul D.; and Kirschner, Roger S., to Honeywell Inc. Wide angle line scanner. 5,004,310, Cl. 350-6.800.

McDonagh, Michael: *See—*
Higgins, John; and McDonagh, Michael, 5,003,868, Cl. 99-357.000.

McDonald, Charles W., to Bodine Company, The. Emergency lighting ballast for compact fluorescent lamps with integral starters. 5,004,953, Cl. 315-86.000.

McDonald, Paul D.: *See—*
McCracken, William L.; McDonald, Paul D.; and Kirschner, Roger S., 5,004,310, Cl. 350-6.800.

McFalls, San M. Yarn end splicing apparatus. 5,003,676, Cl. 28-209.000.

McFarlane, Ian M.: *See—*
Ashton, Michael J.; Bridge, Andrew W.; Chambers, Robert K.; Dron, Donald I.; Fenton, Garry; Harris, Neil V.; Lythgoe, David J.; McFarlane, Ian M.; Newton, Christopher G.; Riddell, David; Smith, Christopher; Stuttle, Keith A. J.; and Toft, Malcolm P., 5,004,747, Cl. 514-309.000.

McGarvey, David C.; and Buffalini, Jerry E., to LRS, Inc. Fire resistant tank construction. 5,004,632, Cl. 427-410.000.

McGee, Dwight H. Pneumatic grinding mill. 5,004,167, Cl. 241-91.000.

McGrath, John J.: *See—*
Parsons, Gerald J.; Greenwald, Brian D.; McGrath, John J.; and Andrasko, Stephen W., 5,005,197, Cl. 379-21.000.

McIntyre, Anna M., executrix: *See—*
Piccone, Dante E.; McIntyre, James E., deceased; and Major, Leroy B., 5,005,065, Cl. 357-38.000.

McIntyre, James E., deceased: *See—*
Piccone, Dante E.; McIntyre, James E., deceased; and Major, Leroy B., 5,005,065, Cl. 357-38.000.

McIntyre, Jonothon M. W., to Lomac Corporation. Rack for flexible collection bags. 5,004,195, Cl. 248-99.000.

McKay Australia Limited: *See—*
Martin, Richard W., 5,003,888, Cl. 104-17.002.

McKeand, Thomas J., Jr.: *See—*
Patton, Robert T.; Vaughn, Walter L.; and McKeand, Thomas J., Jr., 5,004,760, Cl. 521-149.000.

McKee, Michael J.; Miknis, William D.; Pawlikowski, Joseph M.; and Zelko, William E., to AMP Incorporated. Heating apparatus having Curie effect heater. 5,004,887, Cl. 219-85.160.

McKenzie, Jeffrey J.: *See*—
Linder, James C.; and McKenzie, Jeffrey J., 5,004,011, Cl. 137-556.000.
McLaughlin, Hugh R. Pneumatic tire with pivotable ground pads. 5,004,030, Cl. 152-225.00R.
McMaster, Ronald A.; and Shetterly, Donivan M., to Glasstech, Inc. Glass sheet forming method and apparatus utilizing lower full surface vacuum mold and upper ring mold. 5,004,491, Cl. 65-106.000.
McMorries, Lee W., IV; and Saatkamp, James B., to Brunswick Corporation. Closed loop cooling for a marine engine. 5,004,042, Cl. 165-41.000.
McMurtry, David R.: *See*—
Chaney, Raymond J.; McMurtry, David R.; and Wilson, David, 5,004,982, Cl. 324-207.220.
McNamara, David A.: *See*—
Stinar, Robert P.; Calvas, George T.; and McNamara, David A., 5,003,801, Cl. 70-278.000.
McNeil-PPC, Inc.: *See*—
Radebaugh, Galen W.; Murtha, John L.; and Glinecke, Robert, 5,004,613, Cl. 424-465.000.
Wislinski, Martin; Bergquist, Roger; Schroeder, Manfred; Weir, Theodore; Monetti, Matthew; and Fung, Paul, 5,004,579, Cl. 264-517.000.
Mead Corporation, The: *See*—
Landis, Robert A., 5,004,891, Cl. 219-388.000.
Saulas, Alain, 5,004,104, Cl. 206-526.000.
Meckl, Heinz; Klotzer, Sieghart; Wolff, Erich; and Haseler, Helmut, to Agfa-Gevaert Aktiengesellschaft. Process for the production of color photographic images comprising replenishing the developing solution. 5,004,676, Cl. 430-398.000.
Medipro: *See*—
Boiteau, Richard; Labayle, Denis; and Tenaillon, Alain, 5,003,657, Cl. 15-104.330.
Meditron Corporation: *See*—
Talish, Roger J., 5,003,965, Cl. 128-24.0AA.
MedTest Systems, Inc.: *See*—
Guruswamy, Vinodhini; and Elliott, Donald A., 5,004,583, Cl. 422-58.000.
Meguro, Satoshi: *See*—
Ikeda, Shuji; Sasaki, Katsuro; Nagasawa, Kouichi; and Meguro, Satoshi, 5,005,068, Cl. 357-59.000.
Mehner, Martin: *See*—
Wilkes, Lambert H.; Mehner, Martin; and Lalor, William F., 5,003,669, Cl. 19-49.000.
Mehr-Ayin, Kourosh; and Schuh, Paul A., to Sundstrand Corporation. Closed loop control of a hydraulically controlled clutch. 5,004,084, Cl. 192-0.033.
Mehrotra, Vikram P.; and Barker, Ray E., to Pitman-Moore, Inc. Process for producing high purity fused quartz powder. 5,004,488, Cl. 65-18.200.
Mei, Daniele: *See*—
Zanardi, Angelo; Mei, Daniele; and Toselli, Vittorio, 5,004,412, Cl. 418-132.000.
Meier, Helmut-Martin; Kircher, Klaus; and Berg, Klaus, to Bayer Aktiengesellschaft. Process for the production of carboxylic acid esters. 5,004,569, Cl. 260-410.600.
Meier, Jacques, to Ferag AG. Process and apparatus for the buffer storage and conversion of flat products preferably occurring in stream formation. 5,004,092, Cl. 198-347.300.
Meier, Paul R.; and Mueller, Brian D., to Carrier Corporation. Header for a tube-in-tube heat exchanger. 5,004,047, Cl. 165-158.000.
Meinershagen, Charles I., to NewTech Products, Inc. Wire twisting apparatus. 5,004,020, Cl. 140-93.600.
Meixner, Jurgen: *See*—
Blum, Harald; Meixner, Jurgen; Schreckenberg, Manfred; Fleiter, Lothar; and Wellner, Wolfgang, 5,004,779, Cl. 524-591.000.
Melilli, William J.: *See*—
Wolf, Charles B.; Dighe, Shyam V.; Martin, Paul E.; Taylor, Raymond F., Jr.; and Melilli, William J., 5,004,888, Cl. 219-121.520.
Menke, Wilhelm, to NSM Apparatebau GmbH & Co. KG. Electronic dart board. 5,004,247, Cl. 273-376.000.
Menzin, Marvin: *See*—
Kleven, Lawrence P.; Agranat, Edward A.; Crisafulli, Jerry; Robinson, Hugh; Smith, David J.; Wiseley, Thomas; Fortier, Richard C.; Johnson, Severne; and Menzin, Marvin, 5,004,954, Cl. 315-106.000.
Merck & Co., Inc.: *See*—
Allen, Floyd L.; Best, Glen H.; and Lindroth, Thomas A., 5,004,506, Cl. 106-729.000.
DiNinno, Frank P.; Greenlee, Mark L.; and Salzmann, Thomas N., 5,004,739, Cl. 514-210.000.
Dininno, Frank P.; Salzmann, Thomas N.; and Greenlee, Mark L., 5,004,740, Cl. 514-210.000.
Evans, Ben E.; Bock, Mark G.; and Freidinger, Roger M., 5,004,741, Cl. 514-221.000.
Merck Frosst Canada, Inc.: *See*—
Young, Robert N.; Zamboni, Robert; and Gauthier, Jacques Y., 5,004,743, Cl. 514-227.800.
Merickel, Michael B.; Adams, Ann H.; and Brookeman, James R., to University of Virginia. System and method for the noninvasive identification and display of breast lesions and the like. 5,003,979, Cl. 128-653.00A.
Merrell Dow Pharmaceuticals Inc.: *See*—
Liu, Paul S.; Sunkara, Sai P.; and Bowlin, Terry L., 5,004,746, Cl. 514-299.000.
Merrill, Frances S.; Miller, Richard L.; and Miller, Patricia M. International white-water rafting game. 5,004,246, Cl. 273-246.000.
Mesnel, Francois; and Mesnel, Gerard. Shaped section for the guidance and sealing of a movable window, in particular of a motor vehicle door, and its method of manufacture. 5,003,792, Cl. 49-479.000.
Mesnel, Gerard: *See*—
Mesnel, Francois; and Mesnel, Gerard, 5,003,792, Cl. 49-479.000.
Messenger, Edward J.; and Fedorovich, George, to Garlock Inc. Unitized seal with unitizing joint remote from seal lip. 5,004,248, Cl. 277-37.000.
Messerschmitt-Boelkow-Blohm GmbH: *See*—
Spies, Hans; Woehrl, Alfons; and Spies, Martin, 5,005,085, Cl. 358-213.110.
Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See*—
Nissl, Norbert; and Grossler, Peter, 5,003,884, Cl. 102-476.000.
Meta-Probe Inc.: *See*—
Porritt, John; and Scott, Hugh, 5,004,055, Cl. 175-20.000.
Meuron, Bruce R.: *See*—
Lockhart, John C., Jr.; Hartman, Standish C.; Meuron, Bruce R.; and Lyons, Joseph B., Jr., 5,004,185, Cl. 224-3.140.
Meyer, Rolf-Volker: *See*—
Zecher, Wilfried; El-Sayed, Aziz; Haese, Wilfried; Kohler, Burkhard; and Meyer, Rolf-Volker, 5,004,795, Cl. 528-73.000.
Meyer, Urs, to Rieter Machine Works, Ltd. Textile spinning machine. 5,003,668, Cl. 19-0.220.
Miano, Ralph M.: *See*—
Vicari, Richard; Costanza, John R.; Lamonte, Ronald R.; and Miano, Ralph M., 5,004,796, Cl. 528-179.000.
Michaelis, A. John: *See*—
Bartky, W. Scott; Paton, Anthony D.; Temple, Stephen; and Michaelis, A. John, 5,003,679, Cl. 29-25.350.
Michel-Dansac, Francois: *See*—
Boinot, Francois; Cousin, Michel; Francois, Pierre-Michel; and Michel-Dansac, Francois, 5,004,789, Cl. 525-506.000.
Michimoto, Takashi: *See*—
Ishida, Nobuyoshi; Michimoto, Takashi; Miyake, Katsutaro; and Ichige, Toshio, 5,004,718, Cl. 502-217.000.
Micron Technology, Inc.: *See*—
Gonzalez, Fernando, 5,005,072, Cl. 357-23.600.
Miefert, Elke: *See*—
Dethlefs, Ralf-Burkhard; Scholz, Bernd; Wysk, Wolfram; and Miefert, Elke, 5,004,644, Cl. 428-323.000.
Miele, Nadine. Auxiliary nosepiece for eyeglasses. 5,004,334, Cl. 351-54.000.
Mierzwinski, Eugene P., to Hamilton Standard Controls, Inc. Control system for microwave cooking appliance. 5,005,123, Cl. 364-400.000.
Mifune, Hiroyuki; and Urabe, Shigeharu, to Fuji Photo Film Co., Ltd. Silver halide photographic material and process for the preparation thereof. 5,004,679, Cl. 430-567.000.
Mijnhardt B.V.: *See*—
van den Burg, Johannes M. E., 5,003,828, Cl. 73-861.330.
Miknis, William D.: *See*—
McKee, Michael J.; Miknis, William D.; Pawlikowski, Joseph M.; and Zelko, William E., 5,004,887, Cl. 219-85.160.
Miksitz, Frank J., to UFI, Inc. Animal litter cleaning apparatus. 5,003,920, Cl. 119-163.000.
Milani, Gerald: *See*—
Shanbhag, Sudhakar P.; Cousminer, Joseph J.; and Milani, Gerald, 5,004,616, Cl. 426-102.000.
Milcamps, Jacques: *See*—
Vassenaix, Michel; and Milcamps, Jacques, 5,004,926, Cl. 250-492.300.
Millard, Michael W.: *See*—
Harrison, John R.; and Millard, Michael W., 5,003,876, Cl. 101-350.000.
Miller, Donna F.: *See*—
Parker, A. Bruce; and Miller, Donna F., 5,003,970, Cl. 128-90.000.
Miller, Gregory A.; Pearson, Jeffery L.; and Horsch, John D., to General Motors Corporation. Occupant restraint system. 5,004,266, Cl. 280-743.000.
Miller, Jack E., to International Clamp Company. Clamp. 5,004,275, Cl. 285-373.000.
Miller, Lois K., to University of Georgia Research Foundation, Inc. Insect virus vector with broadened host range. 5,004,687, Cl. 435-69.100.
Miller, Patricia M.: *See*—
Merrill, Frances S.; Miller, Richard L.; and Miller, Patricia M., 5,004,246, Cl. 273-246.000.
Miller, Richard L.: *See*—
Merrill, Frances S.; Miller, Richard L.; and Miller, Patricia M., 5,004,246, Cl. 273-246.000.
Miller, Steven A.: *See*—
Svec, Paul S.; Borom, Marcus P.; Szala, Lawrence E.; Brun, Milivoj K.; Miller, Steven A.; and Mourer, David P., 5,004,629, Cl. 427-204.000.
Millet, Jean-Christophe; and Jaccaud, Michel, to Atochem. Continuous electrolytic production of alkali metal perchlorates. 5,004,527, Cl. 204-82.000.
Milliman, James G.; and Franks, Lawrence A., to Burr Oak Tool & Gauge Company. Mechanical tube expander with hairpin bend support. 5,003,691, Cl. 29-727.000.
Millipore Corporation: *See*—
Pluskal, Malcolm G.; Wang, David; and Steuck, Michael J., 5,004,543, Cl. 210-490.000.

Mimura, Hidenori: *See*—
Kitamura, Koichi; Mimura, Hidenori; Yamamoto, Kazuo; and Ohta, Yasumitsu, 5,004,903, Cl. 250-208.100.
Minagawa, Tadao: *See*—
Yoshioka, Takeo; and Minagawa, Tadao, 5,005,181, Cl. 372-59.000.
Minamitaka, Junichi, to Casio Computer Co., Ltd. Automatic accompaniment apparatus. 5,003,860, Cl. 84-609.000.
Mineo, Nunzio: *See*—
Julemont, Michel; Zocchi, Germaine; Mineo, Nunzio; and Fonsny, Pierre, 5,004,556, Cl. 252-99.000.
Ministry of International Trade and Industry: *See*—
Suzuki, Susumu; Ishida, Kazuyuki; and Ozaki, Takeo, 5,003,977, Cl. 128-633.000.
Minks, Floyd M. Engine spark control apparatus. 5,003,946, Cl. 123-335.000.
Minnesota Mining & Manufacturing Company: *See*—
McCarthy, Theresa A., 5,004,111, Cl. 215-232.000.
Polski, Stephen P., 5,004,630, Cl. 427-208.800.
Salaba, Timothy A.; and Wilfong, Debra L., 5,004,351, Cl. 366-152.000.
Minolta Camera Kabushiki Kaisha: *See*—
Fujino, Akihiko; Inoue, Manabu; Omaki, Takanobu; Nakai, Masaaki; Fujii, Akira; and Sekida, Minoru, 5,005,047, Cl. 354-442.000.
Hamada, Masataka; Ishida, Tokuji; and Ishibashi, Kenji, 5,005,039, Cl. 354-402.000.
Matsuo, Hirokazu; and Nagato, Hiroyasu, 5,005,055, Cl. 355-311.000.
Matsushita, Kouji, 5,005,049, Cl. 355-208.000.
Norita, Toshio; Ishida, Tokuji; Hamada, Masataka; and Ishibashi, Kenji, 5,005,040, Cl. 354-402.000.
Ohtani, Junji; Anno, Masahiro; Sano, Eiichi; Machida, Junji; and Masuda, Fumio, 5,004,665, Cl. 430-106.600.
Sato, Tsuyoshi; Inaba, Masahito; and Takata, Naoya, 5,004,349, Cl. 356-402.000.
Toyoshi, Naoki; Oka, Tateki; and Goto, Hiroshi, 5,003,917, Cl. 118-653.000.
Minomiya, Eiichi: *See*—
Tada, Kuniyuki; Minomiya, Eiichi; and Watanabe, Masatoshi, 5,004,855, Cl. 585-489.000.
Minor, James L.: *See*—
Springer, Edward L.; and Minor, James L., 5,004,523, Cl. 162-76.000.
Minowa, Morihiko: *See*—
Aono, Yoshihito; Iwamatsu, Takanori; Minowa, Morihiko; Takenaka, Sadao; Daidoh, Yoshimasa; Nakamura, Hiroshi; and Fujino, Nobutsugu, 5,005,186, Cl. 375-82.000.
Misaki, Takashi; and Aoki, Hitoshi, to Yazaki Corporation. Head-up display for motor vehicles. 5,005,010, Cl. 340-705.000.
Mishima, Yoshio: *See*—
Okamoto, Yasushi; Tahara, Yoshiyuki; and Mishima, Yoshio, 5,004,735, Cl. 514-134.000.
Misugi, Yoshihiko: *See*—
Tohzuka, Takashi; Yamamoto, Ikuo; and Misugi, Yoshihiko, 5,004,554, Cl. 252-54.600.
Mita Industrial Co., Ltd.: *See*—
Kano, Atsushi; Mizuno, Masayuki; Kajiwara, Manabu; Sakaue, Kenji; Abe, Yuji; and Nakamura, Kazuo, 5,004,217, Cl. 271-10.000.
Kozuka, Nobuhiko, 5,005,053, Cl. 355-245.000.
Mutoh, Nariaki; Hanatani, Yasuyuki; and Nishiguchi, Toshihiko, 5,004,662, Cl. 430-59.000.
Mita, Seiichi: *See*—
Amano, Tetsuya; Mita, Seiichi; Izumita, Morishi; Doi, Nobukazu; Kaneko, Mamoru; Yamauchi, Hiroto; and Kasai, Susumu, 5,005,184, Cl. 375-14.000.
Mitchell, James A.: *See*—
Benham, Harold L.; and Mitchell, James A., 5,004,646, Cl. 428-344.000.
Mitchell, Rex P. Apparatus for cleaning irrigation ditch. 5,003,712, Cl. 37-80.00R.
Mitel Telecom Limited: *See*—
Carey, Michael J.; and Anderson, Adrian J., 5,005,183, Cl. 375-1.000.
Mitsche, Roy T.: *See*—
Stranford, Gerald T.; Gonczy, Stephen T.; and Mitsche, Roy T., 5,004,709, Cl. 501-97.000.
Mitsuba Electric Mfg. Co., Ltd.: *See*—
Kuribara, Motoaki; and Fujino, Ikuo, 5,004,090, Cl. 192-112.000.
Oyama, Masayuki, 5,003,809, Cl. 72-446.000.
Mitsubishi Denki K.K.: *See*—
Yoshioka, Takeo; and Minagawa, Tadao, 5,005,181, Cl. 372-59.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Kobayashi, Toshio; Uchikawa, Fusaoki; Nomura, Kenji; Morita, Masao; and Yokoyama, Shouichi, 5,004,720, Cl. 505-1.000.
Komurasaki, Satosi, 5,003,951, Cl. 123-425.000.
Nagai, Takao; and Kusano, Hiromi, 5,004,320, Cl. 350-276.00R.
Sanada, Kazunori; and Kawai, Jyoji, 5,005,141, Cl. 364-550.000.
Seya, Masatomo; Tadokoro, Michihiro; and Okada, Kazuo, 5,004,900, Cl. 250-201.500.
Tanaka, Hidehiko, 5,004,530, Cl. 204-224.00M.
Tobuse, Hiroaki; Murakami, Hidenobu; and Kamio, Masashi, 5,005,138, Cl. 364-519.000.
Ueda, Tetsuya, 5,004,899, Cl. 235-492.000.
Umezaki, Tomokazu; and Takaishi, Tadao, 5,003,959, Cl. 123-647.000.
Wada, Shunichi, 5,004,080, Cl. 188-299.000.
Yoshimoto, Kyosuke; and Shimoda, Kyouji, 5,004,901, Cl. 250-201.500.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Nomura, Isao; and Narita, Kenichi, 5,004,561, Cl. 252-511.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Hashimoto, Toru; Takabatake, Masato; Chino, Masashi; and Takahashi, Akira, 5,004,981, Cl. 324-207.220.
Hatta, Katuhiro; Hiramatsu, Takeo; and Takamiya, Bonnosuke, 5,003,842, Cl. 74-867.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Fudono, Kanji; Ogawa, Hiroshi; Takahashi, Toshimasa; and Yamashita, Toshio, 5,003,786, Cl. 62-156.000.
Kaneko, Shozo; and Kinoshita, Masaaki, 5,003,891, Cl. 110-341.000.
Koga, Yukihiro; and Koyama, Yukio, 5,004,516, Cl. 156-463.000.
Kuriyama, Shigemi, 5,005,112, Cl. 363-21.000.
Taguchi, Toshio; and Okita, Hajime, 5,003,706, Cl. 34-92.000.
Tamura, Yukio; Kinoshita, Kiyoshi; Uwaji, Tetsuo; and Mizuno, Takashi, 5,004,352, Cl. 366-343.000.
Yano, Tadashi; and Hamada, Kenichi, 5,003,877, Cl. 101-363.000.
Mitsubishi Kasei Corporation: *See*—
Gohda, Eiichi; Tsubouchi, Hirohito; Nakayama, Hiroyuki; Hirono, Shuichi; Takahashi, Kozo; Hashimoto, Shuji; and Daikuhara, Yasushi, 5,004,805, Cl. 530-399.000.
Mitsubishi Metal Corporation: *See*—
Arai, Tatsuo; and Haga, Katsumi, 5,004,378, Cl. 407-106.000.
Mitsubishi Petrochemical Co., Ltd.: *See*—
Terauchi, Makoto; Ikeda, Chikako; and Aritomi, Mitsutoshi, 5,004,800, Cl. 528-351.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Ida, Kozo; and Horiuchi, Tetsuya, 5,004,785, Cl. 525-305.000.
Mitsugu, Teruyuki; and Umezawa, Norio, to Matsushita Electric Industrial Co., Ltd. Worm gear motor with a built-in sensor. 5,003,836, Cl. 74-425.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Tojo, Tetsuo; Okada, Keiji; Nakahara, Takashi; and Kikuchi, Yoshiharu, 5,004,787, Cl. 525-332.100.
Yamamoto, Yohzoh; Ishiwata, Shuichi; Yokoyama, Kenji; and Hasegawa, Kimio, 5,004,764, Cl. 523-400.000.
Mitsumori, Koji; and Kume, Hidehiro, to Sony Corporation. Optical head devices for use in disc players. 5,005,162, Cl. 369-44.120.
Miwa, Ichitomo: *See*—
Mochida, Ei; Murakami, Kimihiro; Kato, Kazuo; Kato, Katsuaki; Okuda, Jun; and Miwa, Ichitomo, 5,004,751, Cl. 514-390.000.
Mixon, Larry C.; Snyder, George W.; Hill, Scott D.; Johnson, Gregory L.; Wlodarski, J. Frank; von Spakovsky, Alexis P.; Emerson, John D.; Cole, James M.; and Tipton, John P., to United States of America, Army. Lightweight blast shield. 5,003,883, Cl. 102-476.000.
Miyagi, Tetsuhiro: *See*—
Tadenuma, Masahiko; Miyagi, Tetsuhiro; and Miyazawa, Tadashi, 5,004,776, Cl. 524-377.000.
Miyakawa, Akira; and Inoue, Hiroyuki, to Canon Kabushiki Kaisha. Printer having means for heating a recording sheet and fixing ink thereon. 5,005,025, Cl. 346-25.000.
Miyake, Katsutaro: *See*—
Ishida, Nobuyoshi; Michimoto, Takashi; Miyake, Katsutaro; and Ichige, Toshio, 5,004,718, Cl. 502-217.000.
Miyake, Teruyoshi; and Yamamoto, Tatsuo, to Chyugoku Paalu Distributing Corporation; Shinanen New Ceramic Corporation; and Shinagawa Fuel Co., Ltd. Sterilized glove. 5,003,638, Cl. 2-167.000.
Miyano, Osamu: *See*—
Takahashi, Mitsuru; Shuyama, Hideo; Miyano, Osamu; and Tsutsumi, Yukihiro, 5,004,567, Cl. 260-408.000.
Miyasaka, Tetsuo, to Olympus Optical Company, Ltd. Photographing data setting apparatus for camera. 5,005,033, Cl. 354-289.100.
Miyata, Yukihide; Ishizaka, Hideo; Saito, Yoshio; and Koizumi, Takashi, to Fuji Photo Film Co., Ltd. Biochemical analysis apparatus. 5,004,582, Cl. 422-56.000.
Miyawaki, Makoto: *See*—
Ogawa, Yukio; Hirohata, Michio; Kodaira, Takanori; and Miyawaki, Makoto, 5,005,038, Cl. 354-400.000.
Miyazaki, Asashi: *See*—
Komatsu, Norimasa; and Miyazaki, Asashi, 5,005,094, Cl. 360-105.000.
Miyazaki, Hiroshi, to Furukawa Electric Co., Ltd. Optical cable and optical cable line. 5,004,315, Cl. 350-96.150.
Miyazaki, Kazuo: *See*—
Iida, Shoji; Miyazaki, Kazuo; and Takizawa, Nobuyuki, 5,004,857, Cl. 585-507.000.
Miyazaki, Toshihiko: *See*—
Nishimura, Yukuo; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Nakagiri, Takashi; Saito, Kenji; Kimura, Toshiaki; Matsuda, Hiroshi; Sakai, Kunihiro; and Miyazaki, Toshihiko, 5,004,671, Cl. 430-286.000.
Miyazawa, Tadashi: *See*—
Tadenuma, Masahiko; Miyagi, Tetsuhiro; and Miyazawa, Tadashi, 5,004,776, Cl. 524-377.000.
Miyoshi, Shigetoshi: *See*—
Imai, Hajime; Kito, Shozo; Harada, Shoichi; Yokoyama, Yoshinobu; Nakamura, Syuzi; Miyoshi, Shigetoshi; and Muramatsu, Tadao, 5,003,799, Cl. 70-247.000.
Mizoguchi, Shoichi; and Matsuura, Hideki, to NEC Corporation. Parallel mode adaptive transversal equalizer for high-speed digital communications system. 5,005,185, Cl. 375-15.000.

Mizuno, Masayuki: *See*—
Kano, Atsushi; Mizuno, Masayuki; Kajiwara, Manabu; Sakaue, Kenji; Abe, Yuji; and Nakamura, Kazuo, 5,004,217, Cl. 271-10.000.
Mizuno, Takashi: *See*—
Tamura, Yukio; Kinoshita, Kiyoshi; Uwaji, Tetsuo; and Mizuno, Takashi, 5,004,352, Cl. 366-343.000.
Mizuno, Toru; and Hara, Ryuichi, to Fanuc Ltd. Method for acceleration and deceleration control of servomotors. 5,004,968, Cl. 318-615.000.
Mizusawa International Chemicals, Ltd.: *See*—
Ogawa, Masahide; Sato, Teiji; Tanaka, Masanori; and Takahashi, Noriyuki, 5,004,716, Cl. 501-141.000.
Mizutani, Yoich, to Tokico Ltd. Suspension system. 5,004,265, Cl. 280-707.000.
Moay, Neomi; and Draghi, Enrica, to Interpharm Laboratories Ltd. Complement-dependent cytolytic anti-*Trichomonas vaginalis* monoclonal antibodies. 5,004,694, Cl. 435-240.270.
Mobil Oil Corporation: *See*—
DeCaul, Lorenzo C.; Han, Scott; Palermo, Robert E.; and Walsh, Dennis E., 5,004,856, Cl. 585-500.000.
Harandi, Mohsen N., 5,004,852, Cl. 585-322.000.
Yan, Tsoung Y., 5,004,854, Cl. 585-489.000.
Mobs, Stephan: *See*—
Dreschel, Jurgen; Hog, Peter; and Mobs, Stephan, 5,004,220, Cl. 271-184.000.
Mochida, Ei; Murakami, Kimihiro; Kato, Kazuo; Kato, Katsuaki; Okuda, Jun; and Miwa, Ichitomo, to Mochida Pharmaceutical Co., Ltd. Hydantoin derivatives. 5,004,751, Cl. 514-390.000.
Mochida Pharmaceutical Co., Ltd.: *See*—
Mochida, Ei; Murakami, Kimihiro; Kato, Kazuo; Kato, Katsuaki; Okuda, Jun; and Miwa, Ichitomo, 5,004,751, Cl. 514-390.000.
Mock, Gerhard: *See*—
Huttner, Gerhard; Kruckel, Peter; and Mock, Gerhard, 5,004,363, Cl. 401-75.000.
Modisette, David R., Jr.; and Nelson, Donald R., to AT&T Bell Laboratories. Telecommunication transmission format suited for network-independent timing environments. 5,005,171, Cl. 370-110.100.
Moldovan, Peter K.: *See*—
Theisen, Peter J.; Wycklendt, Daniel A.; Juds, Mark A.; and Moldovan, Peter K., 5,004,874, Cl. 200-144.00R.
Molecular Devices Corporation: *See*—
Kung, Viola T., 5,004,806, Cl. 530-415.000.
Molex Incorporated: *See*—
Previato, Mario; Barbieri, Silvio; and Martucci, Roberto, 5,004,431, Cl. 439-358.000.
Yagi, Masanori; DiViesti, Anthony M.; Regnier, Kent E.; Yamada, Shoji E.; and Walse, Alan S., 5,004,429, Cl. 439-326.000.
Mollett, Christopher C.: *See*—
Humphries, Martyn; Nemcek, Jozef; Padget, John C.; and Mollett, Christopher C., 5,004,631, Cl. 427-385.500.
Molnar, Jozsef: *See*—
Lakatos, Tamas; Molnar, Jozsef; and Madarasz, Endre, 5,005,146, Cl. 364-573.000.
Molnlycke AB: *See*—
Ternstrom, Ingela; and Eriksson, Mats, 5,004,465, Cl. 604-385.100.
Moltech Invent S.A.: *See*—
Duruz, Jean-Jacques, 5,004,524, Cl. 204-243.00R.
Moncrief, Rick L.: *See*—
Behensky, Max L.; Moncrief, Rick L.; Margolin, Jed; and Mott, Stephanie J., 5,005,148, Cl. 364-578.000.
Mondet, Jean J.: *See*—
Aubry, Jacques A.; and Mondet, Jean J., 5,004,215, Cl. 267-140.100.
Monetti, Matthew: *See*—
Wislinski, Martin; Bergquist, Roger; Schroeder, Manfred; Weir, Theodore; Monetti, Matthew; and Fung, Paul, 5,004,579, Cl. 264-517.000.
Monig, Michael: *See*—
Petri, Horst; and Monig, Michael, 5,003,785, Cl. 62-131.000.
Monsanto Company: *See*—
Cadwallader, George W.; Highfill, Louis A.; Kurdys, Gregory D.; and Turigliatto, Richard S., 5,004,589, Cl. 423-315.000.
Dyroff, David R.; Getman, Daniel P.; and Glascock, Joan K., 5,004,558, Cl. 252-95.000.
Montanier, Gerard. Washing device mounted on a motor vehicle and comprising a rotary washing arm which delivers jets of pressurized hot water for cleaning various surfaces. 5,004,156, Cl. 239-130.000.
Monte, Charles; White, Paul J.; and Graham, Anne C., to Monte, Charles. Percussive action modular electronic keyboard. 5,003,859, Cl. 84-423.00R.
Montefibre, S.p.A.: *See*—
Bastioli, Catia; Garlisi, Salvatore; Fornara, Dario; and Bellotti, Vittorio, 5,004,817, Cl. 549-557.000.
Montes, Juan D. System for reproducing three-dimensional, that is four-dimensional, images and, particularly moving images by projection, without the use of coherent light. 5,004,335, Cl. 352-58.000.
Montgomery, Jerold W.: *See*—
Osip, Thomas W.; Montgomery, Jerold W.; and Pezzoli, Paul A., 5,004,110, Cl. 215-232.000.
Monticup, Anthony, Jr.; and Gubernick, Franklin L. Gasoline nozzle with emergency shut-off. 5,004,023, Cl. 141-208.000.
Montierth, Garry L.; Logan, Stephen A.; and Scott, Raymond J., to Bylin Heating Systems, Inc. Rail heating apparatus. 5,004,190, Cl. 246-428.000.
Montuoro, Lou D.; Vandarakis, Toni L.; and Johnson, Richard L., to Amana Refrigeration Inc. Refrigerator door shelves. 5,004,305, Cl. 312-214.000.
Montvila, Stephen V.: *See*—
Noll, John R.; and Montvila, Stephen V., 5,004,541, Cl. 210-251.000.
Moody, G. Lawrence; Leone, David A.; and Bell, Mark E., to Siemens Energy & Automation, Inc. Stored energy contact operating mechanism. 5,004,875, Cl. 200-400.000.
Moody, Paul E., to United States of America, Navy. Submarine torpedo tube collapsible choke. 5,003,909, Cl. 114-238.000.
Moon, William G.: *See*—
Thanos, William N.; Peterson, Bruce R.; Moon, William G.; Lindsay, Joshua; and Stone, Thomas R., 5,005,089, Cl. 360-77.080.
Moore, Arthur W., to Union Carbide Corporation. Pyrolytic boron nitride with columnar crystalline morphology. 5,004,708, Cl. 501-96.000.
Moore, Henry P.: *See*—
Straight, Jay G.; and Moore, Henry P., 5,004,620, Cl. 426-304.000.
Moote, Richard K.; Weber, Gregory T.; and Robinson, William O., to Chrysler Corporation. Transition fuel multiplier. 5,003,944, Cl. 123-299.000.
Moravcsik, Imre: *See*—
Jekkel nee Bokany, Antonia; Albrecht, Karoly; Ambrus, Gabor; Lang, Tibor; Szabo, Istvan M.; Ilkoy, Eva; Konczol, Kalman; Moravcsik, Imre; Hantos, Gabor; Simonovits, Emilia; Lengyel nee Szemenyei, Zsuzsanna; Vida, Zsuzesanna; and Csajagi, Eva, 5,004,695, Cl. 435-253.100.
Morel, Simone. Cap with a rotating casing for flasks, tubes and similar containers. 5,004,127, Cl. 222-521.000.
Moretti, Roberto: *See*—
Varvello, Angelo; Vignotto, Angelo; and Moretti, Roberto, 5,004,358, Cl. 384-446.000.
Morgan, Leslie P.: *See*—
Blumstock, Judith E.; and Morgan, Leslie P., 5,004,106, Cl. 206-581.000.
Morgan, Sonny D. Heated pet house. 5,003,923, Cl. 119-19.000.
Mori, Kazuhiko: *See*—
Takagi, Soya; Mori, Kazuhiko; Kawasaki, Minoru; and Kato, Shinji, 5,004,581, Cl. 420-487.000.
Mori, Tatsuya; Ohsumi, Tadashi; Nakamura, Shigeo; Maeda, Kiyoto; Nishida, Sumio; and Takano, Hirotaka, to Sumitomo Chemical Company, Limited. Aminopyrrole intermediates for fungicides. 5,004,816, Cl. 549-462.000.
Morigaki, Masakazu: *See*—
Seto, Nobuo; and Morigaki, Masakazu, 5,004,678, Cl. 430-548.000.
Moriguchi, Hideyuki: *See*—
Tsubone, Akira; Tomiyoshi, Masanori; Yokomizo, Junichi; Tanaka, Nobuhiro; Moriguchi, Hideyuki; and Hirata, Eiji, 5,004,401, Cl. 414-786.000.
Morita, Masao: *See*—
Kobayashi, Toshio; Uchikawa, Fusaoki; Nomura, Kenji; Morita, Masao; and Yokoyama, Shouichi, 5,004,720, Cl. 505-1.000.
Moritz, Kjell, to Skanska Slakterimasiner. Automatic front leg cutter in a transport slaughtering line. 5,003,665, Cl. 452-185.000.
Moritz, Werner, to Kabelschlepp Gesellschaft mit beschrankter Haftung. Guide or feeder chain. 5,003,765, Cl. 59-78.100.
Moriyama, Yasuyuki: *See*—
Satoh, Yasuta; and Moriyama, Yasuyuki, 5,003,714, Cl. 40-414.000.
Morlock Mechanik GmbH: *See*—
Dalferth, G. Robert, 5,003,872, Cl. 101-163.000.
Moroz, Michael: *See*—
Norton, Paul R.; Moroz, Michael; and Talley, Carol S., 5,004,698, Cl. 437-3.000.
Morris, Carroll E., Jr.; Balliew, Robert E.; Mathieu, Mark A.; and Johnsrud, Darrell B., to Hewlett-Packard Company. Method for regenerating in-circuit test sequences for circuit board components. 5,004,978, Cl. 324-158.00R.
Morris, Douglas A.: *See*—
Grieco, Steven E.; and Morris, Douglas A., 5,004,992, Cl. 333-202.000.
Morrison Molded Fiber Glass Company: *See*—
Brown, Gordon L., Jr., 5,004,226, Cl. 272-93.000.
Morrow, Clifford E. Method and apparatus for attenuation and measurement of laser power at the end of a laser guide. 5,004,338, Cl. 356-218.000.
Morser, Alfred H.; Gildemeister, Walter M.; and Farmer, David M., to Cincinnati Milacron, Inc. Dynamic correction of servo following errors in a computer-numerically controlled system and fixed cycle utilizing same. 5,005,135, Cl. 364-474.350.
Morton, Henry H.: *See*—
Peabody, Alan M.; Anderson, Olin S., Jr.; and Morton, Henry H., 5,004,459, Cl. 604-29.000.
Morton, Philip G., to Aluminum Company of America. Window assembly of extruded plastics material. 5,003,747, Cl. 52-656.000.
Moscovitch, Marko, to Solon Technologies, Inc. Mixed field personnel dosimetry method and apparatus for determination of risk related quantity via a nearly tissue equivalent multi-element thermoluminescent dosimeter. 5,004,921, Cl. 250-337.000.
Moseley, Richard B.: *See*—
Brearley, Malcolm; and Moseley, Richard B., 5,004,299, Cl. 303-15.000.
Brearley, Malcolm; and Moseley, Richard B., 5,004,300, Cl. 303-15.000.

Moser, Francis M.: *See*—
Kohls, Dennis E.; and Moser, Francis M., 5,004,799, Cl. 528-389.000.
Motai, Noboru; Tanaka, Sakae; and Watanabe, Yoshiaki, to Nippon Precision Circuits Ltd.; and Seikosha Co., Ltd. Amorphous-silicon thin film transistor array substrate. 5,005,056, Cl. 357-2.000.
Motokawa, Kazumasu, to NEC Corporation. Method of forming isolation region in integrated circuit semiconductor device. 5,004,701, Cl. 437-47.000.
Motorola: *See*—
Zdebel, Peter J.; and Vasquez, Barbara, 5,004,703, Cl. 437-67.000.
Motorola, Inc.: *See*—
DeLozanne, A. L., 5,004,721, Cl. 505-1.000.
Golio, John M.; and Staudinger, Joseph, 5,005,059, Cl. 357-22.000.
Grieco, Steven E.; and Morris, Douglas A., 5,004,992, Cl. 333-202.000.
Jasinski, Leon, 5,005,014, Cl. 340-825.440.
Robb, Stephen P.; Phipps, John P.; and Gadberry, Michael D., 5,005,061, Cl. 357-23.130.
Wasmer, William D.; Gillespie, Peter J.; Lippmann, James G.; and Le, Hiep M., 5,005,069, Cl. 357-72.000.
Mott, Stephanie J.: *See*—
Behensky, Max L.; Moncrief, Rick L.; Margolin, Jed; and Mott, Stephanie J., 5,005,148, Cl. 364-578.000.
Mou, Lin-Her. First-aid gas mask. 5,003,974, Cl. 128-201.250.
Mourer, David P.: *See*—
Svec, Paul S.; Borom, Marcus P.; Szala, Lawrence E.; Brun, Milivoj K.; Miller, Steven A.; and Mourer, David P., 5,004,629, Cl. 427-204.000.
MTU Friedrichshafen GmbH: *See*—
Gubon, Peter; Sudmanns, Hans; and Teetz, Christoph, 5,003,934, Cl. 123-52.0MV.
Mucic, Vinko; Thieme, Kurt; and Engelmann, Jurgen, to TCH Thermo-Consulting-Heidelberg GmbH. Internal tubular falling film apparatus for the evaporation of liquids and for the absortion or degassing of solutions of two or more substances. 5,004,043, Cl. 165-118.000.
Muckerheide, Myron C., to Seton Health Care Foundation. Laser pumping apparatus. 5,005,182, Cl. 372-72.000.
Muelas-Medrano, Santiago: *See*—
Vidal, Henri; Muelas-Medrano, Santiago; and Segrestin, Pierre, 5,004,376, Cl. 405-284.000.
Mueller, Brian D.: *See*—
Meier, Paul R.; and Mueller, Brian D., 5,004,047, Cl. 165-158.000.
Muller, Erich R.; Priwitzer, Gunther; and Martin, Felix. Servo synchronization with mechanical inter lock. 5,003,834, Cl. 74-339.000.
Muller, Richard P.: *See*—
Bullard, James R.; Muller, Richard P.; Grossi, Benedetto; and Cristine, John, 5,003,963, Cl. 128-11.000.
Mullins, Richard M.: *See*—
Wood, Richard B.; Mullins, Richard M.; and Wojtowicz, John A., 5,004,549, Cl. 210-699.000.
Murakami, Hidenobu: *See*—
Tobuse, Hiroaki; Murakami, Hidenobu; and Kamio, Masashi, 5,005,138, Cl. 364-519.000.
Murakami, Kimihiro: *See*—
Mochida, Ei; Murakami, Kimihiro; Kato, Kazuo; Kato, Katsuaki; Okuda, Jun; and Miwa, Ichitomo, 5,004,751, Cl. 514-390.000.
Murakata, Chikara: *See*—
Yasuzawa, Toru; Nakanishi, Satoshi; Murakata, Chikara; Kase, Hiroshi; Sano, Hiroshi; and Yamada, Koji, 5,004,833, Cl. 536-18.200.
Muraki, Yoshiya; and Koike, Hiroyuki, to Fukuda Densky Co, Ltd. Apparatus for alerting a doctor by radio to provide an alarm for a patient. 5,003,984, Cl. 128-710.000.
Muramatsu, Tadao: *See*—
Imai, Hajime; Kito, Shozo; Harada, Shoichi; Yokoyama, Yoshinobu; Nakamura, Syuzi; Miyoshi, Shigetoshi; and Muramatsu, Tadao, 5,003,799, Cl. 70-247.000.
Murayama, Akihiro; and Koyama, Takeshi, to Kabushiki Kaisha Toshiba. Sample and hold circuit. 5,004,935, Cl. 307-353.000.
Murphy, Judy A.: *See*—
Lee, Richard J.; Smith, Barbara A.; Theys, Robert G.; Theys, Robert A.; and Murphy, Judy A., 5,004,920, Cl. 250-304.000.
Murtha, John L.: *See*—
Radebaugh, Galen W.; Murtha, John L.; and Glinecke, Robert, 5,004,613, Cl. 424-465.000.
Muschong, Gunther: *See*—
Amrhein, Reinhard; Heid, Walter; and Muschong, Gunther, 5,004,015, Cl. 137-625.680.
Musil, Joseph E.: *See*—
Goodwin, Jon D.; and Musil, Joseph E., 5,004,394, Cl. 414-346.000.
Mutoh, Nariaki; Hanatani, Yasuyuki; and Nishiguchi, Toshihiko, to Mita Industrial Co., Ltd. Electrophotographic photosensitive material containing m-phenylenediamine compound. 5,004,662, Cl. 430-59.000.
Mutterer, Francis; and Berger, Kurt, to Ciba-Geigy Corporation. Stabilisation of polyphenylene ethers with macrocyclic polyalkylpiperidine compounds. 5,004,759, Cl. 524-89.000.
Myers, Michael J.: *See*—
Crawford, Paul M.; Campbell, Herbert W.; Myers, Michael J.; and Siverns, Steven L., 5,003,814, Cl. 73-59.000.
Naab, Jakob, to Zoller-Kipper GmbH. Device for emptying containers, especially refuse bins. 5,004,392, Cl. 414-21.000.
Nagai, Koichi: *See*—
Sato, Hiroshi; Hirose, Kenichi; Nagai, Koichi; Yoshioka, Hiroshi; and Nagaoka, Yoshihiko, 5,004,846, Cl. 568-940.000.
Nagai, Kouzi: *See*—
Kuroyanagi, Masatoshi; Suzuki, Masahiko; Matsui, Kazuma; Imaeda, Makoto; Nagai, Kouzi; and Ito, Yoshiaki, 5,004,406, Cl. 417-273.000.
Nagai, Takao; and Kusano, Hiromi, to Mitsubishi Denki Kabushiki Kaisha. Anti-reflection device for a VDT. 5,004,320, Cl. 350-276.00R.
Nagano, Masashi, to Shimano Industrial Co., Ltd. Bicycle pedal. 5,003,841, Cl. 74-594.400.
Nagaoka, Hisayuki; Zenbayashi, Michio; and Shimizu, Chiyuki, to Toshiba Silicone Co., Ltd. Room temperature-curable composition. 5,004,793, Cl. 528-15.000.
Nagaoka, Yoshihiko: *See*—
Sato, Hiroshi; Hirose, Kenichi; Nagai, Koichi; Yoshioka, Hiroshi; and Nagaoka, Yoshihiko, 5,004,846, Cl. 568-940.000.
Nagarajan, Madukkarai K.; Wherley, Fred J.; and Frimel, Jody W., to B. F. Goodrich Company, The. Aqueous laundry detergent compositions containing acrylic acid polymers. 5,004,557, Cl. 252-174.240.
Nagasawa, Kouichi: *See*—
Ikeda, Shuji; Sasaki, Katsuro; Nagasawa, Kouichi; and Meguro, Satoshi, 5,005,068, Cl. 357-59.000.
Nagata, Akio: *See*—
Hayasaka, Hiroshi; and Nagata, Akio, 5,004,453, Cl. 494-39.000.
Nagata, Kohsoku: *See*—
Shimamura, Keizo; Amano, Kagetaka; Aisaka, Tatsuryoshi; Hanai, Satoshi; and Nagata, Kohsoku, 5,004,498, Cl. 75-233.000.
Nagato, Hiroyasu: *See*—
Matsuo, Hirokazu; and Nagato, Hiroyasu, 5,005,055, Cl. 355-311.000.
Naillon, Martine; and Theeten, Jean-Bernard, to U.S. Philips Corporation. Method of and arrangement for image data compression by means of a neural network. 5,005,206, Cl. 382-56.000.
Nakada, Kunihiko; and Akao, Yasushi, to Hitachi, Ltd. Integrated CPU and DMA with shared executing unit. 5,005,121, Cl. 364-200.000.
Nakagawa, Etsuo: *See*—
Yamamoto, Tetsushi; Niwano, Masaru; and Nakagawa, Etsuo, 5,003,919, Cl. 118-716.000.
Nakagawa, Kenji, to Fujitsu Limited. Process for forming a fine pattern having a high aspect ratio. 5,004,927, Cl. 250-492.200.
Nakagiri, Takashi: *See*—
Nishimura, Yukuo; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Nakagiri, Takashi; Saito, Kenji; Kimura, Toshiaki; Matsuda, Hiroshi; Sakai, Kunihiro; and Miyazaki, Toshihiko, 5,004,671, Cl. 430-286.000.
Nakahara, Takashi: *See*—
Tojo, Tetsuo; Okada, Keiji; Nakahara, Takashi; and Kikuchi, Yoshiharu, 5,004,787, Cl. 525-332.100.
Nakai, Masaaki: *See*—
Fujino, Akihiko; Inoue, Manabu; Omaki, Takanobu; Nakai, Masaaki; Fujii, Akira; and Sekida, Minoru, 5,005,047, Cl. 354-442.000.
Nakajima, Tsuyoshi; and Ikeda, Yuji. Signal processing system for flow velocity in laser doppler velocimeter. 5,005,144, Cl. 364-565.000.
Nakamichi Corporation: *See*—
Inoue, Yoshihisa; and Arai, Yasunori, 5,005,093, Cl. 360-99.060.
Yamamoto, Makoto; and Terada, Akio, 5,005,163, Cl. 369-44.360.
Nakamura, Arata, to Omron Tateisi Electronics Co. Reflection type photoelectric switch for detecting the presence of an object. 5,004,908, Cl. 250-221.000.
Nakamura, Hiroshi: *See*—
Aono, Yoshihito; Iwamatsu, Takanori; Minowa, Morihiko; Takenaka, Sadao; Daidoh, Yoshimasa; Nakamura, Hiroshi; and Fujino, Nobutsugu, 5,005,186, Cl. 375-82.000.
Nakamura, Ichiko: *See*—
Kugimiya, Shuzo; Fukumochi, Yoji; Nakamura, Ichiko; Hirai, Tokuyuki; and Suzuki, Hitoshi, 5,005,127, Cl. 364-419.000.
Nakamura, Kazuo: *See*—
Kano, Atsushi; Mizuno, Masayuki; Kajiwara, Manabu; Sakaue, Kenji; Abe, Yuji; and Nakamura, Kazuo, 5,004,217, Cl. 271-10.000.
Nakamura, Shigeo: *See*—
Mori, Tatsuya; Ohsumi, Tadashi; Nakamura, Shigeo; Maeda, Kiyoto; Nishida, Sumio; and Takano, Hirotaka, 5,004,816, Cl. 549-462.000.
Nakamura, Syuzi: *See*—
Imai, Hajime; Kito, Shozo; Harada, Shoichi; Yokoyama, Yoshinobu; Nakamura, Syuzi; Miyoshi, Shigetoshi; and Muramatsu, Tadao, 5,003,799, Cl. 70-247.000.
Nakanishi, Satoshi: *See*—
Yasuzawa, Toru; Nakanishi, Satoshi; Murakata, Chikara; Kase, Hiroshi; Sano, Hiroshi; and Yamada, Koji, 5,004,833, Cl. 536-18.200.
Nakano, Hirofumi: *See*—
Matsuo, Yoshio; Nakano, Hirofumi; Kamiya, Masakuni; and Matsui, Kezuo, 5,004,580, Cl. 419-65.000.
Nakao, Shinroku; Suzuki, Yoshiyuki; and Kato, Hitoshi, to Combi Co., Ltd. Guard attachment/removal structure in baby carriage. 5,004,253, Cl. 280-47.380.
Nakashima, Masato: *See*—
Kakinoki, Yoshikazu; Nakashima, Masato; Koezuka, Tetsuo; Hiraoka, Noriyuki; Tsukahara, Hiroyuki; Suto, Yoshinori; Oshima, Yoshitaka; and Hashinami, Shinji, 5,004,929, Cl. 250-561.000.
Nakashima, Yoshihiro; and Kinoshita, Yasunori, to Fanuc Ltd. Numerical control apparatus with simultaneous function execution. 5,005,134, Cl. 364-474.010.

Nakasuji, Kazuyuki; and Hayashi, Chihiro, to Sumitomo Metal Industries, Ltd. Method of manufacturing clad bar. 5,004,143, Cl. 228-126.000.
Nakatani, Seiichi; Yuhaku, Satoru; Nishimura, Tsutomu; Terada, Yukio; and Baba, Yasuyuki, to Matsushita Electric Industrial Co., Ltd. Multilayered ceramic substrates and method for manufacturing the same. 5,004,640, Cl. 428-195.000.
Nakatani, Seiichi: *See*—
Hakotani, Yasuhiko; Nakatani, Seiichi; Yuuhaku, Satoru; Nishimura, Tsutomu; and Ishida, Toru, 5,004,715, Cl. 501-136.000.
Nakayama, Hiroshi: *See*—
Tsuji, Masahiro; Kawauchi, Susumu; and Nakayama, Hiroshi, 5,004,520, Cl. 156-630.000.
Nakayama, Hiroyuki: *See*—
Gohda, Eiichi; Tsubouchi, Hirohito; Nakayama, Hiroyuki; Hirono, Shuichi; Takahashi, Kozo; Hashimoto, Shuji; and Daikuhara, Yasushi, 5,004,805, Cl. 530-399.000.
Nakhmanson, Raoul S. Displacement machine. 5,004,409, Cl. 418-58.000.
Nalco Chemical Company: *See*—
Beckman, John A.; Huang, Shu-Jen; and Ebrat, Abdol R., 5,004,550, Cl. 210-710.000.
Fong, Dodd W.; and Kowalski, David J., 5,004,786, Cl. 525-344.000.
Namiki, Tomizo; Suzuki, Tamotsu; and Katayama, Masashi, to Fuji Photo Film Co., Ltd. Image-receiving sheet material and process for the formation of transferred image. 5,004,668, Cl. 430-256.000.
Namioka, Takashi: *See*—
Okamura, Masatoshi; Namioka, Takashi; and Shiba, Haruo, 5,004,180, Cl. 242-198.000.
Narikiyo, Hidetoshi; Gotou, Yukifumi; and Chuma, Yoshihiro, to Kabushiki Kaisha Toshiba. Central air conditioning system having compensating control function for total heat load in a plurality of rooms. 5,004,149, Cl. 236-49.300.
Narita, Kenichi: *See*—
Nomura, Isao; and Narita, Kenichi, 5,004,561, Cl. 252-511.000.
Natho, Bradford J.; Andrade, George L.; Wheaton, John M.; and Schmitt, Wayne L, to American Tourister, Inc. Compression-molded carrying case. 5,004,091, Cl. 190-18.00R.
National Distillers and Chemical Corporation: *See*—
Hanes, Ronnie M.; and Kwiatek, Jack, 5,004,568, Cl. 260-410.000.
National Energy Council: *See*—
Dekker, Johannes; and Cronje, Izak J., 5,004,831, Cl. 562-475.000.
National Research Development Corporation: *See*—
Clark, Adrian P., 5,005,188, Cl. 375-94.000.
Elliott, Michael; Janes, Norman F.; and Pulman, David A., 5,004,822, Cl. 556-115.000.
National Starch and Chemical Investment Holding Corporation: *See*—
Billmers, Robert L., 5,004,791, Cl. 527-300.000.
Naumburg, Per. Isolated insertion chute for suction-operated garbage disposal systems. 5,004,377, Cl. 406-120.000.
Nawrocki, Glen A.: *See*—
Burchette, Herbert L.; Hansen, Lee E.; West, James C.; and Nawrocki, Glen A., 5,004,402, Cl. 415-137.000.
NCR Corporation: *See*—
Collins, Donald A., Jr., 5,004,916, Cl. 250-235.000.
Neace, Richard K.: *See*—
Wilson, William B.; DiPietro, Matthew; Neace, Richard K.; Dethier, Vincent B.; Hauss, Raymond G.; and Louk, James R., 5,005,036, Cl. 354-322.000.
Nebashi, Yukichi; and Wada, Takaaki, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Automatic paper feeder. 5,004,515, Cl. 156-350.000.
NEC Corporation: *See*—
Amano, Haruo, 5,005,071, Cl. 357-85.000.
Masuda, Hajime, 5,005,154, Cl. 365-96.000.
Mizoguchi, Shoichi; and Matsuura, Hideki, 5,005,185, Cl. 375-15.000.
Motokawa, Kazumasu, 5,004,701, Cl. 437-47.000.
Shimizu, Haruhito, 5,004,312, Cl. 350-96.130.
Suzuki, Syuji; and Nishio, Makoto, 5,005,166, Cl. 370-1.000.
Takai, Yasuhiro, 5,005,156, Cl. 365-189.050.
NEC Environment Engineering, Ltd.: *See*—
Yamamoto, Yohzoh; Ishiwata, Shuichi; Yokoyama, Kenji; and Hasegawa, Kimio, 5,004,764, Cl. 523-400.000.
NEC Home Electronics Ltd.: *See*—
Itoi, Satoshi, 5,005,190, Cl. 375-108.000.
Nederlandse Centrale Organisatie voor Teegepast-Natturwentenschappelijk Orderzoel: *See*—
Kluft, Cornelis, 5,004,802, Cl. 530-380.000.
Nejime, Yoshito, to Hitachi, Ltd. Unit circuit for constructing a neural network and a semiconductor integrated circuit having the same. 5,004,932, Cl. 307-201.000.
Nelson, Donald R., to AT&T Bell Laboratories. Multi-rate multiplexing arrangement efficiently utilizing multiplexed channel bandwidth. 5,005,170, Cl. 370-84.000.
Nelson, Donald R.: *See*—
Modisette, David R., Jr.; and Nelson, Donald R., 5,005,171, Cl. 370-110.100.
Nelson, Melinda: *See*—
Osborne, James L.; Nelson, Melinda; Enscore, David J.; Yum, Su I.; and Gale, Robert M., 5,004,610, Cl. 424-448.000.
Nemcek, Jozef: *See*—
Humphries, Martyn; Nemcek, Jozef; Padget, John C.; and Mollett, Christopher C., 5,004,631, Cl. 427-385.500.
Nemoto, Isao. Apparatus for producing curvilinear tubes. 5,003,806, Cl. 72-260.000.
Nerrinck, Bernard; and Bonnet, Maurice, to Salomon S.A. Alpine ski boot. 5,003,711, Cl. 36-120.000.
Neumann, Andreas; and Wiese, Michael, to Grote & Hartmann GmbH & Co. KG. Beltable plastic casing for electric plug connectors. 5,004,101, Cl. 206-343.000.
Neuville Industries, Inc.: *See*—
Hollowell, George E.; and Sample, Hugh D., 5,004,132, Cl. 223-1.000.
New England Biolabs, Inc.: *See*—
Chen, Shu-zi; and Wilson, Geoffrey G., 5,004,691, Cl. 435-172.300.
Newkirk, Marc S.: *See*—
Burke, John T.; and Newkirk, Marc S., 5,004,035, Cl. 164-97.000.
Newsome, R. Wayne. Chimney facade system. 5,003,739, Cl. 52-219.000.
NewTech Products, Inc.: *See*—
Meinershagen, Charles I., 5,004,020, Cl. 140-93.600.
Newton, Christopher G.: *See*—
Ashton, Michael J.; Bridge, Andrew W.; Chambers, Robert K.; Dron, Donald I.; Fenton, Garry; Harris, Neil V.; Lythgoe, David J.; McFarlane, Ian M.; Newton, Christopher G.; Riddell, David; Smith, Christopher; Stuttle, Keith A. J.; and Toft, Malcolm P., 5,004,747, Cl. 514-309.000.
Newton, Geoffrey C. Stump burner. 5,003,890, Cl. 110-239.000.
Ney, Hermann, to U.S. Philips Corporation. Method of recognizing continuously spoken words. 5,005,203, Cl. 381-43.000.
NGK Insulators, Ltd.: *See*—
Terada, Nobuhiro; Shimizu, Masataka; and Matsuzawa, Soichiro, 5,003,688, Cl. 29-603.000.
NHK Spring Co., Ltd.: *See*—
Kazama, Toshio, 5,004,977, Cl. 324-158.00P.
Ojima, Juji, 5,004,448, Cl. 474-111.000.
Ojima, Juji, 5,004,449, Cl. 474-138.000.
Nichias Corporation: *See*—
Ashizawa, Masaaki; Nishimoto, Kazuo; Oomura, Atsushi; and Ito, Shuji, 5,004,650, Cl. 428-463.000.
Niedospial, John J., to Eastman Kodak Company. Film cassette. 5,004,176, Cl. 242-71.100.
Niessen, Cornelius: *See*—
Van Berkel, Cornelis H.; Saeijs, Ronald W. J. J.; and Niessen, Cornelius, 5,005,136, Cl. 364-490.000.
Nifco, Inc.: *See*—
Oshida, Tsutomu, 5,004,306, Cl. 312-319.000.
Nigay, Pierre, to Kilrush Limited. Permanent receptacle for collecting urine from women. 5,004,463, Cl. 604-329.000.
Nihon Dempa Kogyo Co., Ltd.: *See*—
Ueno, Yoshifusa; Tanzawa, Takihei; and Suzuki, Takayuki, 5,004,988, Cl. 331-116.00R.
Nihon Kaiheiki Kogyo Kabushiki Kaisha: *See*—
Ohashi, Shigeo, 5,004,318, Cl. 350-96.200.
Niiro, Yasunori: *See*—
Satoh, Toshio; Niiro, Yasunori; Kakegawa, Hisao; and Matsumoto, Hitoshi, 5,004,742, Cl. 514-226.500.
Niizato, Tomonori: *See*—
Matsumoto, Yukihiro; Yoshihara, Kenji; Kajiura, Tetsuya; Niizato, Tomonori; and Yamada, Noriyuki, 5,003,937, Cl. 123-90.120.
Niki, Etsuko: *See*—
Niki, Motohiro; Niki, Etsuko; Kidachi, Misako; Kidachi, Atsushi; Niki, Mieko; Lee, Kap J.; and Lee, Yun, 5,003,922, Cl. 119-15.000.
Niki, Mieko: *See*—
Niki, Motohiro; Niki, Etsuko; Kidachi, Misako; Kidachi, Atsushi; Niki, Mieko; Lee, Kap J.; and Lee, Yun, 5,003,922, Cl. 119-15.000.
Niki, Motohiro; Niki, Etsuko; Kidachi, Misako; Kidachi, Atsushi; Niki, Mieko; Lee, Kap J.; and Lee, Yun. Cage for small experimental animals. 5,003,922, Cl. 119-15.000.
Nikiforov, Ivan I.: *See*—
Goikhman, Yakov A.; Krjukov, Georgy M.; Onotsky, Melis I.; Sorokin, Georgy M.; Filatov, Alexei V.; Tsarapkin, Viktor V.; Yakimov, Vadim P.; Smirnov, Gennady A.; Nikiforov, Ivan I.; Burdukovsky, Alexandr I.; Daibov, Sergei V.; and Kurdjukov, Alexandr S., 5,004,056, Cl. 175-293.000.
Nikolaev, Jury A.: *See*—
Ulyanitsky, Vladimir J.; Gavrilenko, Tamara P.; Nikolaev, Jury A.; and Buteev, Alexandr I., 5,004,021, Cl. 141-67.000.
Nikon Corporation: *See*—
Magome, Nobutaka, 5,004,348, Cl. 356-401.000.
Nilssen, Ole K. Fluorescent lamp ballast with high power factor. 5,004,947, Cl. 315-224.000.
Nilssen, Ole K. Electronic ballast with shock protection feature. 5,004,955, Cl. 315-119.000.
Nilssen, Ole K. Fluorescent lamp ballast with adjustable lamp current. 5,004,959, Cl. 315-291.000.
Nippon Basic Technology Laboratory Co., Ltd.: *See*—
Nishino, Yoshinori; and Kishigami, Junjiro, 5,004,895, Cl. 219-528.000.
Nippon Colin Co., Ltd.: *See*—
White, Curtis D.; and Carpenter, Billy L., 5,003,985, Cl. 128-716.000.
Nippon Hypox Laboratories Incorporated: *See*—
Satoh, Toshio; Niiro, Yasunori; Kakegawa, Hisao; and Matsumoto, Hitoshi, 5,004,742, Cl. 514-226.500.
Nippon Koki Co., Ltd.: *See*—
Hayashi, Minoru; Kobari, Koichi; Sato, Kimiharu; and Kishimoto, Junichi, 5,004,586, Cl. 422-164.000.

Nippon Mining Co., Ltd.: *See—*
Tsuji, Masahiro; Kawauchi, Susumu; and Nakayama, Hiroshi, 5,004,520, Cl. 156-630.000.
Nippon Oil and Fats Co., Ltd.: *See—*
Matsuyama, Kazuo; Sugiura, Takashi; and Komai, Takeshi, 5,004,780, Cl. 525-27.000.
Nippon Petrochemicals Company, Ltd.: *See—*
Bommer, Jerry C.; and Burnham, Bruce F., 5,004,811, Cl. 540-145.000.
Iida, Shoji; Miyazaki, Kazuo; and Takizawa, Nobuyuki, 5,004,857, Cl. 585-507.000.
Nippon Precision Circuits Ltd.: *See—*
Motai, Noboru; Tanaka, Sakae; and Watanabe, Yoshiaki, 5,005,056, Cl. 357-2.000.
Nippon Seiko Kabushiki Kaisha: *See—*
Yamamoto, Kazuo, 5,004,268, Cl. 280-804.000.
Nippon Steel Corporation: *See—*
Kitamura, Koichi; Mimura, Hidenori; Yamamoto, Kazuo; and Ohta, Yasumitsu, 5,004,903, Cl. 250-208.100.
Nippondenso Co., Ltd.: *See—*
Haraguchi, Hiroshi; Tamura, Hiroshi; Kodama, Katuhiko; and Kondo, Toshio, 5,003,955, Cl. 123-489.000.
Kozaki, Tetsuji; Ishikawa, Hiroshi; Yasui, Hideaki; Shimamoto, Mamoru; Hibino, Katsuhiko; and Suzuki, Motoshi, 5,004,264, Cl. 280-707.000.
Kuroyanagi, Masatoshi; Suzuki, Masahiko; Matsui, Kazuma; Imaeda, Makoto; Nagai, Kouzi; and Ito, Yoshiaki, 5,004,406, Cl. 417-273.000.
Tomita, Masahiro; Hayashi, Satoshi; Oda, Shinro; Fujii, Akira; and Tanigawa, Masayoshi, 5,004,945, Cl. 310-328.000.
Yoshino, Yoshimi; Ao, Kenichi; Izawa, Ichiro; and Arasuna, Toshikazu, 5,005,064, Cl. 357-27.000.
Nishida, Fumihiko: *See—*
Yahata, Makoto; and Nishida, Fumihiko, 5,005,044, Cl. 355-40.000.
Nishida, Sumio: *See—*
Mori, Tatsuya; Ohsumi, Tadashi; Nakamura, Shigeo; Maeda, Kiyoto; Nishida, Sumio; and Takano, Hirotaka, 5,004,816, Cl. 549-462.000.
Nishiguchi, Toshihiko: *See—*
Mutoh, Nariaki; Hanatani, Yasuyuki; and Nishiguchi, Toshihiko, 5,004,662, Cl. 430-59.000.
Nishijima, Mitsuru: *See—*
Hara, Kazumasa; Sano, Yasuro; Koike, Mikio; and Nishijima, Mitsuru, 5,003,896, Cl. 112-121.110.
Nishimoto, Kazuo: *See—*
Ashizawa, Masaaki; Nishimoto, Kazuo; Oomura, Atsushi; and Ito, Shuji, 5,004,650, Cl. 428-463.000.
Nishimura, Tsutomu: *See—*
Hakotani, Yasuhiko; Nakatani, Seiichi; Yuuhaku, Satoru; Nishimura, Tsutomu; and Ishida, Toru, 5,004,715, Cl. 501-136.000.
Nakatani, Seiichi; Yuhaku, Satoru; Nishimura, Tsutomu; Terada, Yukio; and Baba, Yasuyuki, 5,004,640, Cl. 428-195.000.
Nishimura, Yukuo; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Nakagiri, Takashi; Saito, Kenji; Kimura, Toshiaki; Matsuda, Hiroshi; Sakai, Kunihiro; and Miyazaki, Toshihiko, to Canon Kabushiki Kaisha. Optical recording medium and optical recording method. 5,004,671, Cl. 430-286.000.
Nishino, Yoshinori; and Kishigami, Junjiro, to Nippon Basic Technology Laboratory Co., Ltd. Heater device used for floor material etc. and floor material with heater contained therein. 5,004,895, Cl. 219-528.000.
Nishio, Makoto: *See—*
Suzuki, Syuji; and Nishio, Makoto, 5,005,166, Cl. 370-1.000.
Nissan Motor Co., Ltd.: *See—*
Imaseki, Takashi; and Kobari, Yuji, 5,005,131, Cl. 364-426.020.
Kato, Koichiro; Fukuhara, Hiroshige; Kamishima, Hiroyuki; and Tsukahara, Hitoshi, 5,005,021, Cl. 343-717.000.
Kobayashi, Jiro, 5,004,002, Cl. 137-39.000.
Takahashi, Hiroshi, 5,005,133, Cl. 364-426.040.
Yoneyama, Syuichi; Obana, Yoshinori; and Fujisawa, Eiichi, 5,003,958, Cl. 123-635.000.
Nisshin Flour Milling Co., Ltd.: *See—*
Ogawa, Osamu; Kishi, Ikuo; Tahara, Yoshiyuki; and Sugita, Masanori, 5,004,756, Cl. 514-655.000.
Okamoto, Yasushi; Tahara, Yoshiyuki; and Mishima, Yoshio, 5,004,735, Cl. 514-134.000.
Nissl, Norbert; and Grossler, Peter, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Hollow of projectile charge. 5,003,884, Cl. 102-476.000.
Nisula, Scott P.; and O'Callaghan, Christopher P., to Chevron Research & Technology Company. Composition and method for removal of hydrogen sulfide. 5,004,588, Cl. 423-226.000.
Nitto Kohki Co., Ltd.: *See—*
Kishi, Katsunobu, 5,004,385, Cl. 409-180.000.
Niwano, Masaru: *See—*
Yamamoto, Tetsushi; Niwano, Masaru; and Nakagawa, Etsuo, 5,003,919, Cl. 118-716.000.
NNC Limited: *See—*
Utton, Donald B.; and Windebank, Stephen R., 5,004,354, Cl. 374-29.000.
Nobles, Charles M.: *See—*
Ivers, Douglas E.; and Nobles, Charles M., 5,004,079, Cl. 188-282.000.
Nogawa, Atsuhiko, to Terumo Kabushiki Kaisha. Plug and blood circulation device with the plug. 5,004,113, Cl. 215-358.000.
Nohara, Makoto: *See—*
Ida, Tomoyasu; Nohara, Makoto; and Seo, Nobuyuki, 5,004,980, Cl. 324-166.000.
Noll, John R.; and Montvila, Stephen V., to Electrolux Water Systems, Inc. Fluid purification system. 5,004,541, Cl. 210-251.000.
Nolle, William: *See—*
Markow, Paul A.; Nolle, William; and Bell, Charles L., 5,004,976, Cl. 324-154.00R.
Nolte, David D.: *See—*
Glass, Alastair M.; Knox, Wayne H.; and Nolte, David D., 5,004,325, Cl. 350-354.000.
Nomura, Isao; and Narita, Kenichi, to Mitsubishi Gas Chemical Company, Inc. Electromagnetic wave-shielding thermoplastic resin composition. 5,004,561, Cl. 252-511.000.
Nomura, Kenji: *See—*
Kobayashi, Toshio; Uchikawa, Fusaoki; Nomura, Kenji; Morita, Masao; and Yokoyama, Shouichi, 5,004,720, Cl. 505-1.000.
Nordica S.p.A.: *See—*
Pozzobon, Alessandro, 5,003,710, Cl. 36-117.000.
Nordisk Gentofte: *See—*
Kuo, George; Masiarz, Frank; Truett, Martha; and Valenzuela, Pablo, 5,004,804, Cl. 530-387.000.
Norgren, Lars E.: *See—*
Hessman, Ingemar; Post, Karl G. Y.; and Norgren, Lars E., 5,004,380, Cl. 407-114.000.
Norita, Toshio; Ishida, Tokuji; Hamada, Masataka; and Ishibashi, Kenji, to Minolta Camera Kabushiki Kaisha. Automatic focus adjusting apparatus of a camera. 5,005,040, Cl. 354-402.000.
Normalair-Garrett (Holdings) Ltd.: *See—*
Hamlin, Humphrey A. S.; and Harral, Michael W., 5,004,485, Cl. 55-160.000.
Norris, Dale M. Method for inducing resistance in plants using environmentally safe antioxidants. 5,004,493, Cl. 71-88.000.
North American Philips Corporation: *See—*
Goldburt, Efim S.; and Hemmer, Richard E., 5,004,625, Cl. 427-38.000.
Latassa, Frank M.; and Leyh, Thomas O., 5,004,949, Cl. 313-492.000.
Shaulov, Avner A.; Herko, Samuel P.; Dorman, Donald R.; and Bhargava, Rameshwar N., 5,004,726, Cl. 505-1.000.
Skinner, Kenneth R., 5,005,084, Cl. 358-194.100.
Northrop Corporation: *See—*
Richardson, William T., 5,003,631, Cl. 2-6.000.
Norton Company: *See—*
Hay, Robert A.; Willkens, Craig A.; and Arsenault, Normand P., 5,004,544, Cl. 210-490.000.
Norton, Paul R.; Moroz, Michael; and Talley, Carol S., to Santa Barbara Research Center. Method of making photodetector with P layer covered by N layer. 5,004,698, Cl. 437-3.000.
Norwegian Contracts A/S: *See—*
Rosendahl, Finn; Fjeld, Svein; Salama, Mamdouh M.; and Gillen, Michael P., 5,004,051, Cl. 166-357.000.
Nottingham, John R.; Spirk, John W., Jr.; and Brokaw, Paul E., to G & S Metal Products Company, Inc. Microwavable metal baking pan with insulating girdle. 5,004,882, Cl. 219-10.55E.
Nowak, William J.: *See—*
Stokes, Ronald E.; Nowak, William J.; Attardi, Anthony A.; and Costanza, Daniel W., 5,005,054, Cl. 355-273.000.
Nowick, James S.: *See—*
Danheiser, Rick L.; and Nowick, James S., 5,004,815, Cl. 549-328.000.
NSM Apparatebau GmbH & Co. KG: *See—*
Menke, Wilhelm, 5,004,247, Cl. 273-376.000.
nuArc Company, Inc.: *See—*
Leonhart, Charles J., 5,005,048, Cl. 355-93.000.
Nuding, Wolfgang: *See—*
Link, Rainer; and Nuding, Wolfgang, 5,003,831, Cl. 73-865.900.
Nugues, Pierre: *See—*
Ikes, Jacques; Le Fur, Joel; and Nugues, Pierre, 5,004,952, Cl. 315-3.500.
N.V. Verbrugge: *See—*
Blontrock, Daniel, 5,004,019, Cl. 139-91.000.
Nysten, Bernhard, to William Prym-Werke GmbH. & Co. KG. Snap fastener. 5,003,673, Cl. 24-662.000.
O&K Orenstrein & Koppel Aktiengesellschaft: *See—*
Schwappach, Dieter, 5,004,397, Cl. 414-686.000.
Oba, Hidehiro: *See—*
Kato, Senji; and Oba, Hidehiro, 5,003,950, Cl. 123-422.000.
Obana, Yoshinori: *See—*
Yoneyama, Syuichi; Obana, Yoshinori; and Fujisawa, Eiichi, 5,003,958, Cl. 123-635.000.
Oblak, Tod A.: *See—*
Lipchak, John B.; Oblak, Tod A.; Bednar, Fred H.; Ciaramitaro, William; Hughes, Francis R.; Smith, John R.; and Gisoni, Gregory A., 5,005,142, Cl. 364-550.000.
O'Brien, Edward F.: *See—*
Sogge, Dale R.; O'Brien, Edward F.; and Czarn, David A., 5,004,876, Cl. 200-83.00P.
O'Callaghan, Christopher P.: *See—*
Nisula, Scott P.; and O'Callaghan, Christopher P., 5,004,588, Cl. 423-226.000.
O'Callaghan, Wilfred B.: *See—*
Hunter, John A.; Scamans, Geoffrey M.; O'Callaghan, Wilfred B.; and Wycliffe, Paul A., 5,004,654, Cl. 429-50.000.

Ochiai, Masami: *See*—
Kanai, Takashi; Ochiai, Masami; Oshina, Morio; and Sonoda, Mitsuo, 5,003,776, Cl. 60-434.000.
Ochs, Heinrich: *See*—
Franz, Karl-Heinz; Ochs, Heinrich; and Difflipp, Kurt, 5,003,871, Cl. 101-148.000.
Ociepka, Val S.: *See*—
Horgan, John J.; and Ociepka, Val S., 5,004,044, Cl. 165-145.000.
O'Connor, James T.; and Courtright, David A., to SGS-Thomson Microelectronics, Inc. System for synchronizing data frame groups in a serial bit stream. 5,005,191, Cl. 375-116.000.
Oda, Shinro: *See*—
Tomita, Masahiro; Hayashi, Satoshi; Oda, Shinro; Fujii, Akira; and Tanigawa, Masayoshi, 5,004,945, Cl. 310-328.000.
Office National d'Etudes et de Recherches Aerospatiales: *See*—
Falempin, Francois, 5,004,187, Cl. 244-53.00B.
Ogai, Mikio: *See*—
Fukushima, Toru; Takabayashi, Tsunehisa; and Ogai, Mikio, 5,005,179, Cl. 372-46.000.
Oganesyan, Suren. Method of making a channel set ring. 5,003,678, Cl. 29-10.000.
Ogasawara, Hiromitsu, to Tachi-S Co., Ltd. Method and device for controlling slide motion of a vehicle seat. 5,004,967, Cl. 318-568.100.
Ogawa, Hiroshi: *See*—
Fudono, Kanji; Ogawa, Hiroshi; Takahashi, Toshimasa; and Yamashita, Toshio, 5,003,786, Cl. 62-156.000.
Ogawa, Masahide; Sato, Teiji; Tanaka, Masanori; and Takahashi, Noriyuki, to Mizusawa International Chemicals, Ltd. Synthetic stevensite and process for preparation thereof. 5,004,716, Cl. 501-141.000.
Ogawa, Masanobu; and Shibata, Shinya, to Asahi Glass Company, Ltd. Transparent glass antenna for an automobile. 5,005,020, Cl. 343-713.000.
Ogawa, Masao, to Brother Kogyo Kabushiki Kaisha. Apparatus for disconnecting a needle bar and threading on a sewing machine. 5,003,899, Cl. 112-221.000.
Ogawa, Masao, to Brother Kogyo Kabushiki Kaisha. Thread securing device in a sewing machine. 5,003,900, Cl. 112-242.000.
Ogawa, Osamu; Kishi, Ikuo; Tahara, Yoshiyuki; and Sugita, Masanori, to Lederle (Japan) Ltd.; and Nisshin Flour Milling Co., Ltd. Anticancer activity potentiator. 5,004,756, Cl. 514-655.000.
Ogawa, Yukio; Hirohata, Michio; Kodaira, Takanori; and Miyawaki, Makoto, to Canon Kabushiki Kaisha. Focal length changeable camera. 5,005,038, Cl. 354-400.000.
Ogilvie, Kelvin K.: *See*—
Fortin, J. Andre ; Ogilvie, Kelvin K.; Tsantrizos, Youla S.; and Kope, Harry H., 5,004,754, Cl. 514-570.000.
Oh, Myung H.; Lee, Kyung J.; Chung, In J.; Lee, Nam Y.; and Kim, Myung S., to Korea Institute of Science and Technology. Fabrication method for high voltage zinc oxide varistor. 5,004,573, Cl. 264-61.000.
Ohashi, Shigeo, to Nihon Kaiheiki Kogyo Kabushiki Kaisha. Small optical fiber switch. 5,004,318, Cl. 350-96.200.
Ohba, Yasuo: *See*—
Izumiya, Toshihide; Ohba, Yasuo; and Hatano, Ako, 5,005,057, Cl. 357-17.000.
Ohnishi, Akio: *See*—
Iwanaga, Takeshi; and Ohnishi, Akio, 5,004,242, Cl. 273-169.000.
Ohnuki, Ichiro: *See*—
Akashi, Akira; Kadohara, Terutake; Ohnuki, Ichiro; and Higashihara, Masaki, 5,005,037, Cl. 354-400.000.
Ohsumi, Tadashi: *See*—
Mori, Tatsuya; Ohsumi, Tadashi; Nakamura, Shigeo; Maeda, Kiyoto; Nishida, Sumio; and Takano, Hirotaka, 5,004,816, Cl. 549-462.000.
Ohta, Wasaburo: *See*—
Yagawara, Shinji; Manaka, Junji; and Ohta, Wasaburo, 5,003,812, Cl. 73-31.060.
Ohta, Yasumitsu: *See*—
Kitamura, Koichi; Mimura, Hidenori; Yamamoto, Kazuo; and Ohta, Yasumitsu, 5,004,903, Cl. 250-208.100.
Ohtaka, Keiji: *See*—
Suda, Yasuo; Ohtaka, Keiji; Suzuki, Kenji; Ishizaki, Akira; and Aoyama, Keisuke, 5,005,041, Cl. 354-407.000.
Ohtani, Junji; Anno, Masahiro; Sano, Eiichi; Machida, Junji; and Masuda, Fumio, to Minolta Camera Kabushiki Kaisha. Toner containing polymeric-magnetic coordination complex. 5,004,665, Cl. 430-106.600.
Ohtuka, Nobuo; and Matsumoto, Kouichi, to Sanyo Electric Co., Ltd. Hybrid circuit module having bridge circuit and rectifying circuit disposed on a same substrate. 5,005,113, Cl. 363-37.000.
Ohzeki, Yoshiyuki; and Amikura, Kazuo, to Copal Co., Ltd. Stepper motor with input connector array. 5,004,941, Cl. 310-49.00R.
Oil-Dri Corporation of America: *See*—
Brooks, David D.; Brophy, Shirley A.; and Goss, George R., 5,004,570, Cl. 260-427.000.
Ojima, Juji, to NHK Spring Co., Ltd. Tensioner. 5,004,448, Cl. 474-111.000.
Ojima, Juji, to NHK Spring Co., Ltd. Sealed tensioner. 5,004,449, Cl. 474-138.000.
Oka, Tateki: *See*—
Toyoshi, Naoki; Oka, Tateki; and Goto, Hiroshi, 5,003,917, Cl. 118-653.000.
Okada, Haruo: *See*—
Takahashi, Hiroaki; Okada, Haruo; Matsumoto, Katsuya; and Umino, Masuo, 5,004,546, Cl. 210-635.000.
Okada, Kazuo, to Universal Company, Ltd. Ball-shooting game machine. 5,004,238, Cl. 273-121.00B.
Okada, Kazuo: *See*—
Seya, Masatomo; Tadokoro, Michihiro; and Okada, Kazuo, 5,004,900, Cl. 250-201.500.
Okada, Keiji: *See*—
Tojo, Tetsuo; Okada, Keiji; Nakahara, Takashi; and Kikuchi, Yoshiharu, 5,004,787, Cl. 525-332.100.
Okamoto, Yasushi; Tahara, Yoshiyuki; and Mishima, Yoshio, to Nisshin Flour Milling Co., Ltd. Pharmaceutical compositions for the inhibition of tumor metastasis. 5,004,735, Cl. 514-134.000.
Okamoto, Yoshihisa: *See*—
Klemarczyk, Philip T.; and Okamoto, Yoshihisa, 5,004,842, Cl. 568-640.000.
Okamura, Masatoshi; Namioka, Takashi; and Shiba, Haruo, to TDK Corporation. Magnetic tape cassette. 5,004,180, Cl. 242-198.000.
Okano, Masaru: *See*—
Shibazaki, Toshiji; Okano, Masaru; Kishida, Naoto; Ozaki, Yoshihiro; and Iyama, Kunihiko, 5,004,996, Cl. 338-36.000.
Okayasu, Hideo: *See*—
Okayasu, Kenji; and Okayasu, Hideo, 5,003,709, Cl. 36-107.000.
Okayasu, Kenji; and Okayasu, Hideo, to Rikio Co., Ltd. Prick-preventing shoe. 5,003,709, Cl. 36-107.000.
Okazaki, Kakuma; and Kitamura, Takayuki, to Japan Aircraft Mfg. Co., Ltd. Deployable and collapsible structure. 5,003,736, Cl. 52-108.000.
Okazaki, Tadashi: *See*—
Hara, Yasuhiro; Inoue, Mitsuhiro; Baba, Hideo; Okazaki, Tadashi; and Kudo, Shigeru, 5,004,089, Cl. 192-107.00M.
Okimoto, Haruo: *See*—
Shibata, Masanori; Okimoto, Haruo; Akagi, Toshimichi; and Tashima, Seiji, 5,003,781, Cl. 60-600.000.
Okino, Tadashi: *See*—
Fukushima, Nobuo; Sakai, Shinji; Takdea, Osamu; Takei, Masahiro; Suzuki, Yasutomo; Okino, Tadashi; and Jinnai, Shigeru, 5,005,088, Cl. 360-69.000.
Okita, Hajime: *See*—
Taguchi, Toshio; and Okita, Hajime, 5,003,706, Cl. 34-92.000.
Okuda, Jun: *See*—
Mochida, Ei; Murakami, Kimihiro; Kato, Kazuo; Kato, Katsuaki; Okuda, Jun; and Miwa, Ichitomo, 5,004,751, Cl. 514-390.000.
Okui, Susumu, to Konica Corporation. Document conveyance apparatus facilitating conveyance belt replacement. 5,004,223, Cl. 271-275.000.
Okun, Jerome M.: *See*—
Perlman, Stephen G.; Okun, Jerome M.; Palevich, John H.; and Lundblad, James A., 5,005,011, Cl. 340-728.000.
Okutsu, Eiichi; Hirano, Mitsunori; and Yagihara, Morio, to Fuji Photo Film Co., Ltd. High-contrast development process for silver halide photographic material. 5,004,670, Cl. 430-265.000.
Olesen, Paul, to Swingline Inc. Guide anvil including movable clinching wings for stapler. 5,004,142, Cl. 227-155.000.
Olin Corporation: *See*—
Roberts, Katherine P.; Geiger, Jon R.; and Carney, Jayne F., 5,004,682, Cl. 435-6.000.
Wood, Richard B.; Mullins, Richard M.; and Wojtowicz, John A., 5,004,549, Cl. 210-699.000.
Olivier, Michel: *See*—
Rotman, Frederic; Rancon, Yannick; Queille, Philippe; and Olivier, Michel, 5,004,489, Cl. 65-32.200.
Olsen, Eric. Fluid foil system. 5,003,903, Cl. 114-102.000.
Olson, Larry D.; and Kamla, Jeffrey R., to Allied-Signal Inc. Polyimide resin laminates. 5,004,775, Cl. 524-371.000.
Olson, Thomas E.; and Vigil, Dennis M., to InterVentional Technologies, Inc. Apparatus for manufacturing atherectomy torque tubes. 5,003,918, Cl. 118-665.000.
Olympus Optical Co., Ltd.: *See*—
Matsui, Hiroshi; and Toda, Akitoshi, 5,004,902, Cl. 250-201.800.
Miyasaka, Tetsuo, 5,005,033, Cl. 354-289.100.
Takayama, Syuichi; Tsukaya, Takashi; Ueda, Yasuhiro; Hatta, Shinji; and Abe, Masashi, 5,003,991, Cl. 128-784.000.
Tsuchida, Hirofumi, 5,004,329, Cl. 350-427.000.
Omaki, Takanobu: *See*—
Fujino, Akihiko; Inoue, Manabu; Omaki, Takanobu; Nakai, Masaaki; Fujii, Akira; and Sekida, Minoru, 5,005,047, Cl. 354-442.000.
Omar S.n.c. di Mario Baiocchi Alinovi & C.: *See*—
Alinovi, Mario B., 5,003,667, Cl. 452-125.000.
Omron Tateisi Electronics Co.: *See*—
Nakamura, Arata, 5,004,908, Cl. 250-221.000.
Onan Corporation: *See*—
Fanner, John C.; and Halstead, Nick V., 5,003,949, Cl. 123-382.000.
Ono Pharmaceutical Co., Ltd.: *See*—
Kim, Soonih; Takeda, Kazuhisa; and Sasatani, Seiei, 5,004,612, Cl. 424-450.000.
Onoda, Shigeyoshi: *See*—
Saijo, Yasutsugu; Chiku, Kazuyoshi; and Onoda, Shigeyoshi, 5,004,336, Cl. 353-122.000.
Onodera, Norio, to Alps Electric Co., Ltd. Stress-relieving flexible circuit board holder plate. 5,005,105, Cl. 361-398.000.
Onotsky, Melis I.: *See*—
Goikhman, Yakov A.; Krjukov, Georgy M.; Onotsky, Melis I.; Sorokin, Georgy M.; Filatov, Alexei V.; Tsarapkin, Viktor V.; Yakimov, Vadim P.; Smirnov, Gennady A.; Nikiforov, Ivan I.; Burdukovsky, Alexandr I.; Daibov, Sergei V.; and Kurdjukov, Alexandr S., 5,004,056, Cl. 175-293.000.

Onoue, Akihiro, to Sanshin Kogyo Kabushiki Kaisha. Speed detecting device for marine propulsion unit. 5,004,439, Cl. 440-2.000.
Onufrak, Andrew F.: *See*—
Brown, Donald G.; and Onufrak, Andrew F., 5,004,205, Cl. 248-476.000.
Oohinata, Osamu; and Yanagida, Jun. Cosmetic applicator and method of producing the same. 5,003,660, Cl. 15-244.100.
Oohira, Jun: *See*—
Uda, Masashi; and Oohira, Jun, 5,004,466, Cl. 604-385.200.
Oomae, Tadayuki: *See*—
Mashita, Kentaro; Fujii, Takeshi; and Oomae, Tadayuki, 5,004,782, Cl. 525-64.000.
Oomura, Atsushi: *See*—
Ashizawa, Masaaki; Nishimoto, Kazuo; Oomura, Atsushi; and Ito, Shuji, 5,004,650, Cl. 428-463.000.
Oono, Toshio; and Uemura, Hiroki, to Aisin Takaoka Co., Ltd. Ventilated disk and process for making same. 5,004,078, Cl. 188-218.00A.
Opelz, Gerhard: *See*—
Terness, Peter; and Opelz, Gerhard, 5,004,604, Cl. 424-85.500.
Oppenlaender, Knut: *See*—
Vogel, Hans-Henning; Rath, Hans P.; Jakob, Claus P.; and Oppenlaender, Knut, 5,004,478, Cl. 44-398.000.
O'Quinn, Alethea H.: *See*—
Presswood, J. Kenneth; and O'Quinn, Alethea H., 5,004,627, Cl. 427-133.000.
Orama, Angel M.: *See*—
Cherukuri, Subraman R.; Chau, Tommy L.; Raman, Krishna P.; and Orama, Angel M., 5,004,595, Cl. 424-48.000.
Orbisphere Corporation: *See*—
Hale, John M., 5,004,532, Cl. 204-415.000.
Orlandi, Ireneo, to Alfa Costruzioni Meccaniche S.p.A. Device for the alignment of bottles provided with a reference molding in rotary labeling machinery. 5,004,517, Cl. 156-567.000.
Orscheln Co.: *See*—
Carlson, Harold L.; DeWitt, Michael D.; Martel, Louis, Jr.; Kelley, Larry W.; and Tayon, Jeffrey E., 5,004,077, Cl. 188-2.00D.
Orschlen Co.: *See*—
Italiano, Anthony J., 5,003,837, Cl. 74-501.50R.
Orthopedic Designs, Inc.: *See*—
Azer, Samir N.; Salman, Naser N.; and Krause, William R., 5,003,969, Cl. 128-87.00R.
Osborn, John J. Polar co-ordinate digitizer. 5,004,870, Cl. 178-18.000.
Osborne, James L.; Nelson, Melinda; Enscore, David J.; Yum, Su I.; and Gale, Robert M., to ALZA Corporation. Subsaturated nicotine transdermal therapeutic symstem. 5,004,610, Cl. 424-448.000.
O'Shea, Thomas M.: *See*—
Koblitz, Francis F.; O'Shea, Thomas M.; Stoner, Beverly A.; and Yula, Joseph J., 5,004,869, Cl. 174-84.00C.
Oshida, Tsutomu, to Nifco, Inc. Drawer device. 5,004,306, Cl. 312-319.000.
Oshima, Hisaichi; and Yamashita, Masami, to Furuno Electric Co., Ltd. Thermal recorder. 5,005,027, Cl. 346-76.0PH.
Oshima, Yoshitaka: *See*—
Kakinoki, Yoshikazu; Nakashima, Masato; Koezuka, Tetsuo; Hiraoka, Noriyuki; Tsukahara, Hiroyuki; Suto, Yoshinori; Oshima, Yoshitaka; and Hashinami, Shinji, 5,004,929, Cl. 250-561.000.
Oshina, Morio: *See*—
Kanai, Takashi; Ochiai, Masami; Oshina, Morio; and Sonoda, Mitsuo, 5,003,776, Cl. 60-434.000.
Osip, Thomas W.; Montgomery, Jerold W.; and Pezzoli, Paul A., to Abbott Laboratories. Retortable closure for plastic container. 5,004,110, Cl. 215-232.000.
Oslapas, Algis; and Rumpel, Manfred, to Ford Motor Company. Steering system for the rear wheels of a vehicle. 5,004,063, Cl. 180-79.100.
Ostergaard, David A., to Cedarapids, Inc. Impeller bar assembly with adjustable locking mechanism. 5,004,169, Cl. 241-192.000.
Ostoich, Vladimir E.: *See*—
Hillman, Robert S.; Cobb, Michael E.; Allen, Jimmy D.; Gibbons, Ian; Ostoich, Vladimir E.; and Winfrey, Laura J., 5,004,923, Cl. 250-341.000.
Osypka, Peter. Apparatus for implanting electrodes and the like in animal bodies. 5,003,990, Cl. 128-772.000.
Otaka, Ken; Matsuo, Noritada; Tsushima, Kazunori; and Yano, Toshihiko, to Sumitomo Chemical Company, Limited. Novel carboxylic acid esters, method for their production and insecticides containing them as active ingredient. 5,004,753, Cl. 514-531.000.
Otis Engineering Corporation: *See*—
Arterbury, Bryant A., 5,004,049, Cl. 166-228.000.
Otokawa, Mitsuhiro; and Takimoto, Hiroyuki, to Canon Kabushiki Kaisha. Brushless motor with torque compensation. 5,004,965, Cl. 318-254.000.
Otsu, Hitonobu: *See*—
Ishibai, Isao; and Otsu, Hitonobu, 5,004,330, Cl. 350-432.000.
Oudet, Claude; Drey, Gilbert; and Veignat, Norbert, to Portescap. Method of manufacturing a synchronous electric motor with magnetized rotar. 5,003,686, Cl. 29-596.000.
Ovonic Synthetic Materials Company Inc.: *See*—
Ovshinsky, Stanford R.; and Young, Rosa, 5,004,725, Cl. 505-1.000.
Ovshinsky, Stanford R.; and Young, Rosa, to Ovonic Synthetic Materials Company Inc. Parametrically modified superconductor material. 5,004,725, Cl. 505-1.000.
Owen, Donald W., to Southwest Electric Company. Transient-filtered transformer. 5,005,100, Cl. 361-35.000.
Oyama, Masayuki, to Mitsuba Electric Mfg. Co., Ltd. Method of mounting and demounting molds to and from press molding machine. 5,003,809, Cl. 72-446.000.
Ozaki, Takeo: *See*—
Suzuki, Susumu; Ishida, Kazuyuki; and Ozaki, Takeo, 5,003,977, Cl. 128-633.000.
Ozaki, Yoshihiro: *See*—
Shibazaki, Toshiji; Okano, Masaru; Kishida, Naoto; Ozaki, Yoshihiro; and Iyama, Kunihiko, 5,004,996, Cl. 338-36.000.
Ozawa, Nobuyuki: *See*—
Tomura, Yoshihiro; Maruhashi, Keiji; and Ozawa, Nobuyuki, 5,004,364, Cl. 401-110.000.
Pabon, Delfin: *See*—
Grunert, Kurt A.; Pabon, Delfin; and Cheski, Ronald A., 5,005,104, Cl. 361-355.000.
Paccar Inc.: *See*—
Foot, John, 5,004,062, Cl. 180-69.210.
Pacific Chemical Co., Ltd.: *See*—
Kim, Young D.; and Ha, Byung J., 5,004,737, Cl. 514-182.000.
Packaging Industries Group, Inc.: *See*—
Berkley, Robert D.; and Shaughnessy, Terry P., 5,003,722, Cl. 43-3.000.
Padget, John C.: *See*—
Humphries, Martyn; Nemcek, Jozef; Padget, John C.; and Mollett, Christopher C., 5,004,631, Cl. 427-385.500.
Paepke, Edwin E. Cleaning apparatus. 5,003,659, Cl. 15-209.00D.
Pagano, Daniel M., to Eastman Kodak Company. Camera operating mechanism. 5,005,035, Cl. 354-206.000.
Pahnke, Klaus-Dieter; Holl, Rolf; and Becker, Wilfried, to Rheinmetall GmbH. Projectile for combatting actively and passively recting armor. 5,003,886, Cl. 102-521.000.
Pai, Damodar M.: *See*—
Badesha, Santokh S.; Stolka, Milan; Pai, Damodar M.; and Abkowitz, Martin A., 5,004,663, Cl. 430-59.000.
Palermo, Robert E.: *See*—
DeCaul, Lorenzo C.; Han, Scott; Palermo, Robert E.; and Walsh, Dennis E., 5,004,856, Cl. 585-500.000.
Palevich, John H.: *See*—
Perlman, Stephen G.; Okun, Jerome M.; Palevich, John H.; and Lundblad, James A., 5,005,011, Cl. 340-728.000.
Palfray, Michel, to Etablissements Proteor. Prosthesis for leg amputation and a process for its manufacture. 5,004,477, Cl. 623-53.000.
Palfy, Robert M.: *See*—
MacLennan, Charles; Hamilton, Douglas D.; and Palfy, Robert M., 5,004,026, Cl. 144-3.00D.
Palmer, Leon Robert. Mechanical pencil. 5,004,362, Cl. 401-53.000.
Palmieri, Beniamino; and Garlati, Rodolfo, to Ricerche Biomediche S.r.l. Improvements in automatic mechanical suturing guns. 5,004,469, Cl. 606-139.000.
Pandl, Klaus; and Patsch, Manfred, to BASF Aktiengesellschaft. Copper formazan reactive dyes containing a monofluorotriazine or monochlorotriazine group. 5,004,807, Cl. 534-618.000.
PanZhiHua Iron & Steel Co.: *See*—
Yu, Meng W.; Su, Shihuai; Chen, Yue Z.; Zheng, Ticheng; Ji, Kebin; Ling, Shou R.; Lin, Jian C.; Deng, Jianhui; and Zhang, Kunwu, 5,004,510, Cl. 148-146.000.
Paquette, Louis J., to Du Pont de Nemours, E. I., and Company. Dry disconnect coupling and safety cap for portable tanks. 5,004,209, Cl. 251-144.000.
Paraska, Theodore F.: *See*—
Lapp, Roger H.; and Paraska, Theodore F., 5,003,687, Cl. 29-600.000.
Pardridge, William M., to Univ. of CA; and Alkermes. Cationized antibodies for delivery through the blood-brain barrier. 5,004,697, Cl. 436-547.000.
Pareschi, Flavio: *See*—
Cardani, Silvestro; and Pareschi, Flavio, 5,003,999, Cl. 134-105.000.
Park, Chang M.; and Schammel, Wayne P., to Amoco Corporation. Process for oxidation of alkyl aromatic compounds. 5,004,830, Cl. 562-413.000.
Park, Eugene S.; and Aghajanian, Michael K., to Lanxide Technology Company, LP. Method of surface bonding materials together by use of a metal matrix composite, and products produced thereby. 5,004,034, Cl. 164-97.000.
Parker, A. Bruce; and Miller, Donna F., to Parker Medical Associates. Roll form medical bandaging product, method of constructing same and container for roll form bandaging product. 5,003,970, Cl. 128-90.000.
Parker, Jeffery R.: *See*—
Pristash, David J.; and Parker, Jeffery R., 5,005,108, Cl. 362-31.000.
Parker Medical Associates: *See*—
Parker, A. Bruce; and Miller, Donna F., 5,003,970, Cl. 128-90.000.
Parker, Robert P.: *See*—
Rumreich, Mark F.; and Parker, Robert P., 5,005,201, Cl. 381-24.000.
Parrette, Kim S.: *See*—
Roach, John E.; and Parrette, Kim S., 5,003,907, Cl. 114-221.00R.
Parris, Michael. Roll-type toilet tissue having hemorrhoid-treating medication therein. 5,004,636, Cl. 428-43.000.
Parschat, Lothar: *See*—
Pleschiutschnigg, Fritz-Peter; Parschat, Lothar; Franzen, Hans U.; Pfluger, Manfred; and Giaser, Josef, 5,004,040, Cl. 164-453.000.
Parsons, Gerald J.; Greenwald, Brian D.; McGrath, John J.; and Andrasko, Stephen W., to Communications Test Design, Inc. Method and apparatus as for testing a telephone line interface card. 5,005,197, Cl. 379-21.000.

Pasternak, Mordechai; Bartels, Craig R.; and Reale, John, Jr., to Texaco Inc. Process for pervaporization using membrane separating means. 5,004,861, Cl. 585-818.000.
Pastorius, Walter J.: *See*—
Pryor, Timothy R.; Hageniers, Omer L.; Pastorius, Walter J.; Liptay-Wagner, Nicholas; and Clarke, Donald A., 5,004,339, Cl. 356-241.000.
Patel, Ambelal R.: *See*—
Cortolano, Frank P.; Seltzer, Raymond; and Patel, Ambelal R., 5,004,770, Cl. 524-99.000.
Paton, Anthony D.: *See*—
Bartky, W. Scott; Paton, Anthony D.; Temple, Stephen; and Michaelis, A. John, 5,003,679, Cl. 29-25.350.
Patronis, Eugene T. Cinema sound system for unperforated screens. 5,004,067, Cl. 181-188.000.
Patsch, Manfred: *See*—
Pandl, Klaus; and Patsch, Manfred, 5,004,807, Cl. 534-618.000.
Patterson, E. Ennalls. Carton handling device. 5,004,145, Cl. 229-117.260.
Patton, Robert T.; Vaughn, Walter L.; and McKeand, Thomas J., Jr., to Dow Chemical Company, The. Biocidal foams. 5,004,760, Cl. 521-149.000.
Paul, James L.: *See*—
Broussard, Jerry A.; Auerbach, Andrew B.; Yang, Nan L.; Paul, James L.; Zheng, Yong C.; and Zhang, Chong L., 5,004,798, Cl. 528-230.000.
Paul, Marius A. Gas turbine engine. 5,003,766, Cl. 60-39.150.
Pauley, Gary T.: *See*—
Bobst, Albert M.; and Pauley, Gary T., 5,004,809, Cl. 536-29.000.
Pauwels, Robert S.: *See*—
Vermeulen, Leon L.; Pauwels, Robert S.; De Smedt, Willy P.; and Vervloet, Ludovicus H., 5,004,659, Cl. 430-14.000.
Pavel, Andreas. High fidelity stereophonic reproduction system. 5,005,202, Cl. 381-25.000.
Pawlikowski, Joseph M.: *See*—
McKee, Michael J.; Miknis, William D.; Pawlikowski, Joseph M.; and Zelko, William E., 5,004,887, Cl. 219-85.160.
Peabody, Alan M.; Anderson, Olin S., Jr.; and Morton, Henry H. Continuous cyclic peritoneal dialysis system and method. 5,004,459, Cl. 604-29.000.
Pearson, Jeffery L.: *See*—
Miller, Gregory A.; Pearson, Jeffery L.; and Horsch, John D., 5,004,266, Cl. 280-743.000.
Pedersen, Helge L. Cover for a load-carrying space, preferably for vehicles. 5,004,032, Cl. 160-84.100.
Pedersen, Thor: *See*—
Aune, Jan A.; and Pedersen, Thor, 5,004,496, Cl. 75-10.280.
Pedley, Derek G.: *See*—
Webb, Brian C.; Pedley, Derek G.; Prosser, Stephen J.; Hijikigawa, Masaya; and Furubayashi, Hisatoshi, 5,004,700, Cl. 437-42.000.
Pelt & Hooykas B.V.: *See*—
Hooykaas, Carel W. J., 5,004,357, Cl. 384-121.000.
Pelt, J. Eugene, to Spade leasing, Inc. Stepped top fluid storage tank. 5,004,269, Cl. 280-837.000.
Penczak, John P., to Butler Manufacturing Company. Side rail for trenchduct. 5,003,737, Cl. 52-126.200.
Peppers, Norman A., to SRI International. Beam scanning method and apparatus. 5,004,311, Cl. 350-6.900.
Percec, Elena S.; and Takigawa, Doreen Y., to Standard Oil Company, The. Blends of high nitrile copolymers and thermoplastic polymers. 5,004,783, Cl. 525-77.000.
Perlman, Stephen G.; Okun, Jerome M.; Palevich, John H.; and Lundblad, James A., to Apple Computer, Inc. Vertical filtering apparatus for raster scanned display. 5,005,011, Cl. 340-728.000.
Perlman, Stuart S., to RCA Licensing Corporation. Adaptive multi-standard video comb filter. 5,005,074, Cl. 358-31.000.
Perna, Barbara G.: *See*—
Lipscomb, Dennis E.; Wilhelm, Gary L.; Perna, Barbara G.; and Guenthner, Waldemar G., 5,003,695, Cl. 30-193.000.
Perry Equipment Corporation: *See*—
Perry, Scott G., 5,004,282, Cl. 294-16.000.
Perry, Scott G., to Perry Equipment Corporation. Useful improvements in utility street cover removal tools and methods. 5,004,282, Cl. 294-16.000.
Perryman, James D.; and Green, John M. Method and apparatus for the prevention of fast-forwarding of a video cassette tape. 5,005,099, Cl. 360-132.000.
Peterson, Bruce R.: *See*—
Thanos, William N.; Peterson, Bruce R.; Moon, William G.; Lindsay, Joshua; and Stone, Thomas R., 5,005,089, Cl. 360-77.080.
Peterson, James H. Clothing including insect repellent strips. 5,003,635, Cl. 2-69.000.
Petoca Ltd.: *See*—
Tamura, Tatsuya; and Takamatsu, Akio, 5,004,511, Cl. 156-89.000.
Petri, Horst; and Monig, Michael, to Dr. Ing h.c.F. Porsche Aktiengesellschaft. Air-conditioning system for a vehicle. 5,003,785, Cl. 62-131.000.
Petri, William A., Jr.: *See*—
Ravdin, Jonathan I.; and Petri, William A., Jr., 5,004,608, Cl. 424-88.000.
Petzold, Rainer; Fritz, Walter; and Wiencek, Norbert, to Zahnradfabrik Friedrichshafen AG. Clutch assembly for a motor vehicle. 5,004,086, Cl. 192-85.00C.
Pezzoli, Paul A.: *See*—
Osip, Thomas W.; Montgomery, Jerold W.; and Pezzoli, Paul A., 5,004,110, Cl. 215-232.000.
Pfaff, Susan E.: *See*—
Terrell, John; Kadis, Paul M.; Hiney, Leonard L.; and Pfaff, Susan E., 5,003,807, Cl. 72-351.000.
Pflaum, Hermann; and Strehler, Richard, to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co. Apparatus and a method for testing of synchronizing systems. 5,003,817, Cl. 73-118.100.
Pfluger, Manfred: *See*—
Pleschiutschnigg, Fritz-Peter; Parschat, Lothar; Franzen, Hans U.; Pfluger, Manfred; and Glaser, Josef, 5,004,040, Cl. 164-453.000.
Phaff, Rox; and Bedekovic, Davor, to Ciba-Geigy Corporation. Chromogenic phthalides and azaphthalides. 5,004,813, Cl. 548-463.000.
Phares Pharmaceutical Research NV: *See*—
Leigh, Steven, 5,004,611, Cl. 424-450.000.
Phelps-Tointon, Inc.: *See*—
Bublewicz, Leszek, 5,003,800, Cl. 70-264.000.
Philippe, Michel; and Sebag, Henri, to Societe Anonyme Dite: L'Oreal. Aromatic esters of macrolidic and lincosamidic antibiotics and pharmaceutical and cosmetic compositions containing them. 5,004,729, Cl. 514-29.000.
Philippe, Michel; and Sebag, Henri, to L'Oreal. Polycyclic aromatic esters of macrolidic and lincosamidic antibiotics and pharmaceutical and cosmetic compositions containing them. 5,004,730, Cl. 514-029.000.
Philippe, Michel; and Sebag, Henri, to Societe Anonyme Dite: L'Oreal. Unsaturated cycloaliphatic esters of macrolidic and lincosamidic antibiotics and pharmaceutical and cosmetic compositions containing them. 5,004,731, Cl. 514-29.000.
Philippe, Michel; and Sebag, Henri, to Societe Anonyme Dite: L'Oreal. Polyaromatic esters of macrolidic and lincosamidic antibiotics and pharmaceutical and cosmetic compositions containing them. 5,004,732, Cl. 514-29.000.
Philippe, Michel; and Sebag, Henri, to Societe Anonyme Dite: L'Oreal. Esters of the etretinic type or related to macrolidic and lincosamidic antibiotics and pharmaceutical and cosmetic compositions containing said esters. 5,004,733, Cl. 514-029.000.
Philippe, Michel; and Sebag, Henri, to Societe Anonyme Dite: L'Oreal. Diaromatic esters of macrolidic and lincosamidic antibiotics and pharmaceutical and cosmetic compositions containing them. 5,004,734, Cl. 514-29.000.
Phillips, Donnie C. Device for holding chalk for application to tips of pool cues. 5,004,233, Cl. 273-21.000.
Phillips, Gerald W.: *See*—
Devon, Thomas J.; Phillips, Gerald W.; Puckette, Thomas A.; Stavinoha, Jerome L.; and Vanderbilt, Jeffrey J., 5,004,823, Cl. 556-136.000.
Phillips Petroleum Company: *See*—
Craig, William S.; and Siegel, Robert S., 5,004,688, Cl. 435-69.300.
Phipps, John P.: *See*—
Robb, Stephen P.; Phipps, John P.; and Gadberry, Michael D., 5,005,061, Cl. 357-23.130.
Phyb U.S.A., Inc.: *See*—
Kalantar, S. Javad, 5,004,473, Cl. 606-234.000.
Piatt, Richard. Greeting card system. 5,004,271, Cl. 283-65.000.
Picaut, Guy: *See*—
Antoine, Michel; Barreau, Michel; Desconclois, Jean-Francois; Girard, Philippe; and Picaut, Guy, 5,004,745, Cl. 514-254.000.
Piccone, Dante E.; McIntyre, James E., deceased (by McIntyre, Anna M., executrix); and Major, Leroy B., to General Electric Company. High current gate turn-off thyristor. 5,005,065, Cl. 357-38.000.
Pich, Rene: *See*—
Thompson, Barry A., 5,004,603, Cl. 424-81.000.
Pickens, Donald: *See*—
Harnish, Daniel F.; Pickens, Donald; and Zweig, Andrew M., 5,004,790, Cl. 526-242.000.
Pico Electronics Limited: *See*—
Thompson, David R., 5,005,187, Cl. 375-94.000.
Pierrat, Michel. Variable positive fluid displacement apparatus with movable chambers. 5,004,404, Cl. 917-53.000.
Piezo Crystal Company: *See*—
Hurley, Leslie C., 5,004,987, Cl. 331-70.000.
Pilkington plc: *See*—
Dickinson, Clive F., 5,004,706, Cl. 501-27.000.
Pinard, Michel M. E.: *See*—
Grynberg, Gilbert; Pinard, Michel M. E.; and Faucheux, Marc A. F., 5,004,341, Cl. 356-350.000.
Pineau, Jean-Pierre: *See*—
Frehaut, Jean-Pierre; and Pineau, Jean-Pierre, 5,003,882, Cl. 102-387.000.
Pinto, Alwyn, to Imperial Chemical Industries PLC. Steam reforming process. 5,004,592, Cl. 423-652.000.
Pioneer Electronic Corporation: *See*—
Kanda, Masao, 5,005,080, Cl. 358-160.000.
Piskunen, Raimo A. T.: *See*—
Kankkunen, Lauri P. A.; Piskunen, Raimo A. T.; and Rantala, Borje T., 5,003,981, Cl. 128-677.000.
Pitman-Moore, Inc.: *See*—
Mehrotra, Vikram P.; and Barker, Ray E., 5,004,488, Cl. 65-18.200.
Pitney Bowes Inc.: *See*—
Connell, Richard A.; Keating, Raymond; Sansone, Ronald P.; and Schumacher, Karl H., 5,005,124, Cl. 364-401.000.
Cordery, Robert A., 5,005,001, Cl. 340-551.000.
Pittman, Debra: *See*—
Kaufman, Randal J.; and Pittman, Debra, 5,004,803, Cl. 530-383.000.
Pizzacar, Anthony. Advertising cap nameplate. 5,003,640, Cl. 2-199.000.

Pleschiutschnigg, Fritz-Peter; Parschat, Lothar; Franzen, Hans U.; Pfluger, Manfred; and Glaser, Josef, to Mannesmann Aktiengesellschaft. Method of continuous casting. 5,004,040, Cl. 164-453.000.

Pluskal, Malcolm G.; Wang, David; and Steuck, Michael J., to Millipore Corporation. Charge-modified hydrophobic membrane materials and method for making the same. 5,004,543, Cl. 210-490.000.

Pneumo Abex Corporation: *See—*
Vanderlaan, Robert D., 5,004,940, Cl. 310-36.000.

Podola, Tore: *See—*
Emmerling, Winfried; Wichelhaus, Juergen; and Podola, Tore, 5,004,794, Cl. 528-52.000.
Loth, Helmut; Helpenstein, Klaus; Podola, Tore; and Knop, Bernhard, 5,004,769, Cl. 524-43.000.

Polski, Stephen P., to Minnesota Mining and Manufacturing Company. Process of making zone adhesive/release coated tape. 5,004,630, Cl. 427-208.800.

Pool, Kenneth D., Jr.: *See—*
Finitzo, Terese; and Pool, Kenneth D., Jr., 5,003,986, Cl. 128-731.000.

Popper, Peter: *See—*
Hallam, Donald E.; Popper, Peter; Staunton, Harold F.; Taylor, Robert E.; and Yngve, Paul W., 5,003,763, Cl. 57-297.000.

Porritt, John; and Scott, Hugh, to Meta-Probe Inc. Vibratory core drill apparatus for the recovery of soil or sediment core samples. 5,004,055, Cl. 175-20.000.

Porteous, Paul D. Dental instrument mat. 5,004,418, Cl. 433-77.000.

Portescap: *See—*
Oudet, Claude; Drey, Gilbert; and Veignat, Norbert, 5,003,686, Cl. 29-596.000.

Pospisil, Joseph, to Teleflex Incorporated. Cable routing end fitting assembly. 5,003,838, Cl. 74-502.400.

Post, Karl G. Y.: *See—*
Hessman, Ingemar; Post, Karl G. Y.; and Norgren, Lars E., 5,004,380, Cl. 407-114.000.

Powers, Scott. Leg stretching apparatus. 5,004,228, Cl. 272-125.000.

Poynter, Timothy M. Article dispensing package. 5,004,122, Cl. 221-155.000.

Pozzobon, Alessandro, to Nordica S.p.A. Ski boot. 5,003,710, Cl. 36-117.000.

PPG Industries, Inc.: *See—*
Sherby, James E., 5,003,729, Cl. 51-283.00R.

PPM Pure Metals GmbH: *See—*
Hofmann, Hartmut, 5,004,821, Cl. 556-70.000.

Prasad, Ravi: *See—*
Haas, Oscar W.; Prasad, Ravi; and Smolarek, James, 5,004,482, Cl. 55-16.000.

Prasse, Karl-Heinz, to Siemens Aktiengesellschaft. Circuit for determining power of received light having superimposition of low frequency current. 5,004,907, Cl. 250-214.0AG.

Precision Interconnect Corporation: *See—*
Cabourne, Michael K., 5,004,438, Cl. 439-825.000.

Preisner, Peter M.: *See—*
Hinzmann, Alfred; Shu, Timour T.; Drewnowski, Wojciech S.; and Preisner, Peter M., 5,004,467, Cl. 604-904.000.

Presswood, J. Kenneth; and O'Quinn, Alethea H., to Ethyl Corporation. Polyimides for mold release. 5,004,627, Cl. 427-133.000.

Prestel, James F.: *See—*
Weglarz, Michael W.; Vincent, Michael T.; Prestel, James F.; and Sisoler, Paul G., 5,003,952, Cl. 123-478.000.
Weglarz, Michael W.; Vincent, Michael T.; Prestel, James F.; and Sisoler, Paul G., 5,003,953, Cl. 123-478.000.

Prevail, Inc.: *See—*
Haskin, Marvin E., 5,005,126, Cl. 364-413.130.

Previato, Mario; Barbieri, Silvio; and Martucci, Roberto, to Molex Incorporated. Reinforced connector latch. 5,004,431, Cl. 439-358.000.

Prevorsek, Dusan C.: *See—*
Das, Sajal; and Prevorsek, Dusan C., 5,004,788, Cl. 525-504.000.

Prevost, Michel: *See—*
Elleaume, Philippe; and Prevost, Michel, 5,005,149, Cl. 364-728.010.

Price Brothers Company: *See—*
Baas, Kevin R., 5,004,274, Cl. 285-288.000.

Price, Carolyn R., legal representative: *See—*
Keller, Teddy M.; and Price, Thomas R., deceased, 5,004,801, Cl. 528-360.000.

Price, Thomas R., deceased: *See—*
Keller, Teddy M.; and Price, Thomas R., deceased, 5,004,801, Cl. 528-360.000.

Prince Corporation: *See—*
Lanser, Mike L.; and Elenbaas, Tony J., 5,004,289, Cl. 296-97.120.

Pristash, David J.; and Parker, Jeffery R., to Lumitex, Inc. Thin panel illuminator. 5,005,108, Cl. 362-31.000.

Privalov, Nikolai T.: *See—*
Juschenko, Konstantin A.; Varenchuk, Pavel A.; Kovalev, Valentin D.; Chvertko, Anatoly I.; Privalov, Nikolai T.; and Kuzmenko, Vladimir G., 5,004,885, Cl. 219-73.200.

Priwitzer, Gunther: *See—*
Muller, Erich R.; Priwitzer, Gunther; and Martin, Felix, 5,003,834, Cl. 74-339.000.

Procter & Gamble Company, The: *See—*
Majeti, Satyanarayana; Guay, Christopher B.; and Crisanti, Mark M., 5,004,597, Cl. 424-52.000.

Proctor & Gamble Company: *See—*
Howe, David J., 5,004,121, Cl. 220-458.000.

Proksa, Roland; Roschmann, Peter; and van den Berg, Noel J. M., to U.S. Philips Corporation. Circuit arrangement for generating rf signals for MR examinations. 5,004,983, Cl. 324-322.000.

Pronova AB: *See—*
Berg, Sven-Olof; Broden, Ingemar; and Johansen, Odvar, 5,004,395, Cl. 414-412.000.

Propellex: *See—*
Jones, Ronald G., 5,003,879, Cl. 102-204.000.

Propper, Robert H. Oral endosteal implants and a process for preparing and implanting them. 5,004,422, Cl. 433-175.000.

Prosser, Stephen J.: *See—*
Webb, Brian C.; Pedley, Derek G.; Prosser, Stephen J.; Hijikigawa, Masaya; and Furubayashi, Hisatoshi, 5,004,700, Cl. 437-42.000.

Protection Protection, Inc.: *See—*
Blumstock, Judith E.; and Morgan, Leslie P., 5,004,106, Cl. 206-581.000.

Protein Design Labs, Inc.: *See—*
Tso, J. Yun; and Queen, Cary L., 5,004,692, Cl. 435-183.000.

Provence, Marc; and Graillat, Gerard, to Salomon S.A. Front binding for cross-country ski boot. 5,004,262, Cl. 280-615.000.

Prum, Sebastian, to Albert-Frankenthal AG. Folding apparatus with improved web transport. 5,004,451, Cl. 493-359.000.

Pryor, Timothy R.; Hageniers, Omer L.; Pastorius, Walter J.; Liptay-Wagner, Nicholas; and Clarke, Donald A., to Diffracto Ltd. Method and apparatus for determining physical characteristics of objects and object surfaces. 5,004,339, Cl. 356-241.000.

Puckette, Thomas A.: *See—*
Devon, Thomas J.; Phillips, Gerald W.; Puckette, Thomas A.; Stavinoha, Jerome L.; and Vanderbilt, Jeffrey J., 5,004,823, Cl. 556-136.000.

Puetz, Peter A.: *See—*
Marino, Joseph A.; Makhija, Surender K.; Taghikhani, Majid; and Puetz, Peter A., 5,004,979, Cl. 324-160.000.

Pugach, Joseph; and Salek, Jeffrey S., to Aristech Chemical Corporation. Preparation of unsaturated ketones from acetone and paraformaldehyde (II). 5,004,839, Cl. 568-390.000.

Pugliese, Joseph S.; and Garman, Charles L., to Brodart Co. Method of making protective book coverings. 5,004,514, Cl. 156-251.000.

Pulman, David A.: *See—*
Elliott, Michael; Janes, Norman F.; and Pulman, David A., 5,004,822, Cl. 556-115.000.

Purcell, Alexander M., to Summagraphics Corporation. Digitizer stylus having side switch. 5,004,871, Cl. 178-18.000.

Purser, Brian. Crushing apparatus. 5,004,168, Cl. 241-101.700.

Quantel, S.A.: *See—*
Grynberg, Gilbert; Pinard, Michel M. E.; and Faucheux, Marc A. F., 5,004,341, Cl. 356-350.000.

Quantum Corp.: *See—*
Thanos, William N.; Peterson, Bruce R.; Moon, William G.; Lindsay, Joshua; and Stone, Thomas R., 5,005,089, Cl. 360-77.080.

Queen, Cary L.: *See—*
Tso, J. Yun; and Queen, Cary L., 5,004,692, Cl. 435-183.000.

Queille, Philippe: *See—*
Rotman, Frederic; Rancon, Yannick; Queille, Philippe; and Olivier, Michel, 5,004,489, Cl. 65-32.200.

Quenneville, Raymond N.: *See—*
DeConti, John P.; and Quenneville, Raymond N., 5,003,829, Cl. 73-862.120.

Quinnell, Geoffrey C., to Marley Tile A.G. Roof verge system. 5,003,732, Cl. 52-94.000.

Radcliff, Ruth. Door latch holder. 5,004,279, Cl. 292-288.000.

Radebaugh, Galen W.; Murtha, John L.; and Glinecke, Robert, to McNeil-PPC, Inc. Oral sustained release pharmaceutical formulation and process. 5,004,613, Cl. 424-465.000.

Radjy, Nader A.; and Briner, Michael S., to Advanced Micro Devices, Inc. Optimized electrically erasable PLA cell for minimum read disturb. 5,005,155, Cl. 365-185.000.

Raduechel, Bernd; Skuballa, Werner; Vorbrueggen, Helmut; Loge, Olaf; and Schilliner, Ekkehard, to Schering Aktiengesellschaft. Novel 9-haloprostaglandins, processes for their preparation, and their use as medicinal agents. 5,004,752, Cl. 514-530.000.

Ragland, William L.; and Elfaki, Mohamed G., to University of Georgia Research Foundation, Inc. Method of immunizing poultry. 5,004,607, Cl. 424-88.000.

RAI Radiotelevisione Italiana S.p.A.: *See—*
Stroppina, Mario; and Ronchetti, Luigi, 5,005,076, Cl. 358-135.000.

Raman, Krishna P.: *See—*
Cherukuri, Subraman R.; Chau, Tommy L.; Raman, Krishna P.; and Orama, Angel M., 5,004,595, Cl. 424-48.000.

Rameshk, Sohrab S.: *See—*
Becker, Thomas P.; Rameshk, Sohrab S.; and Crass, Matthew M., 5,004,984, Cl. 324-402.000.

Ramshaw, Colin, to Imperial Chemical Industries PLC. Process for effecting electrochemical reaction. 5,004,526, Cl. 204-73.00A.

Ramtron Corporation: *See—*
Larson, William L., 5,005,102, Cl. 361-313.000.

Ramzan, Chaudhary M. Non-irritating detackifying composition. 5,004,502, Cl. 106-287.130.

Rancon, Yannick: *See—*
Rotman, Frederic; Rancon, Yannick; Queille, Philippe; and Olivier, Michel, 5,004,489, Cl. 65-32.200.

Randall, Ovid. Shock cord and cover assembly. 5,003,672, Cl. 24-300.000.

Rantala, Borje T.: *See—*
Kankkunen, Lauri P. A.; Piskunen, Raimo A. T.; and Rantala, Borje T., 5,003,981, Cl. 128-677.000.

Rapp, Robert A.: *See*—
Claar, Terry D.; Johnson, William B.; and Rapp, Robert A., 5,004,714, Cl. 501-134.000.
Rastetter, William H.: *See*—
Light, David R.; and Rastetter, William H., 5,004,690, Cl. 435-138.000.
Ratcliff, Kenneth W. Electronic control for a fluid system. 5,005,006, Cl. 340-611.000.
Rath, Hans P.: *See*—
Vogel, Hans-Henning; Rath, Hans P.; Jakob, Claus P.; and Oppenlaender, Knut, 5,004,478, Cl. 44-398.000.
Rau, Gunnar: *See*—
Glunz, Wolfgang; and Rau, Gunnar, 5,003,889, Cl. 101-228.000.
Raudys, Vytas A.: *See*—
Stall, Alan D.; and Raudys, Vytas A., 5,003,666, Cl. 452-21.000.
Ravdin, Jonathan I.; and Petri, William A., Jr., to University of Virginia Alumni Patents Foundation, The. Amebiasis vaccine. 5,004,608, Cl. 424-88.000.
Raver, Norman: *See*—
Jackson, Kenneth P.; and Raver, Norman, 5,004,317, Cl. 350-96.200.
Raychem Corporation: *See*—
Tucker, Donald L., 5,004,432, Cl. 439-417.000.
Rayman, Gerard A. Device for testing fluids. 5,004,584, Cl. 422-58.000.
Rayner, Ernest. Fence dropper. 5,004,211, Cl. 256-47.000.
Raynor, Peter H. Collapsible hatch screen. 5,003,905, Cl. 114-201.00R.
Raytheon Company: *See*—
Borglum, Brian P., 5,004,712, Cl. 501-126.000.
Bowen, Robert F.; Dudley, Kenneth W.; and Maiellano, Joseph C., Jr., 5,004,617, Cl. 426-233.000.
Deaett, Michael A., 5,005,204, Cl. 381-51.000.
Dorschner, Terry A.; and Smith, Irl W., 5,004,343, Cl. 356-350.000.
RCA Licensing Corporation: *See*—
Perlman, Stuart S., 5,005,074, Cl. 358-31.000.
Rumreich, Mark F.; and Parker, Robert P., 5,005,201, Cl. 381-24.000.
Reale, John, Jr.: *See*—
Pasternak, Mordechai; Bartels, Craig R.; and Reale, John, Jr., 5,004,861, Cl. 585-818.000.
Reale, Serge, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Joule-Thomson cooler. 5,003,783, Cl. 62-51.200.
Redington, Clarence P.: *See*—
Kester, Jervis D.; and Redington, Clarence P., 5,003,771, Cl. 60-243.000.
Reece Construction Company, Inc.: *See*—
Kohls, Dennis E.; and Moser, Francis M., 5,004,799, Cl. 528-389.000.
ReFalo, John, III: *See*—
Connors, Peter J.; Scully, Sean; Bria, Frank; and ReFalo, John, III, 5,004,103, Cl. 206-372.000.
Regitar Power Tools Co., Ltd.: *See*—
Sheen, Dony, 5,004,054, Cl. 173-12.000.
Regnier, Kent E.: *See*—
Yagi, Masanori; DiViesti, Anthony M.; Regnier, Kent E.; Yamada, Shoji E.; and Walse, Alan S., 5,004,429, Cl. 439-326.000.
Reil, Wilheim, to Tetra Pak Holdings & Finance S.A. Apparatus for the integral moulding of a synthetic plastics part. 5,004,411, Cl. 425-117.000.
Reilly, Michael: *See*—
Griffin, David; Campbell, Jonathan; Reilly, Michael; and Rosenbaum, Richard, 5,005,122, Cl. 364-200.000.
Reindel, John, to United States of America, Navy. Constricted split block waveguide low pass filter with printed circuit filter substrate. 5,004,993, Cl. 333-208.000.
Reinshaw plc: *See*—
Chaney, Raymond J.; McMurtry, David R.; and Wilson, David, 5,004,982, Cl. 324-207.220.
Reinz-Dichtunga-Gesellschaft mbH: *See*—
Grosch, Peter; Haas, Gerhard; and Kremer, Ingo, 5,004,249, Cl. 277-207.00R.
Remcon Plastics, Inc.: *See*—
Connors, Peter J.; Scully, Sean; Bria, Frank; and ReFalo, John, III, 5,004,103, Cl. 206-372.000.
Remet Corporation: *See*—
Feagin, Roy C., 5,004,039, Cl. 164-361.000.
Research Foundation of State University of New York, The: *See*—
Erichsen, Jonathan T.; Evinger, Craig; and Karten, Harvey J., 5,004,683, Cl. 435-7.210.
Retelsdorf, Hans-Joachim: *See*—
Born, Dieter; Knauf, Peter; and Retelsdorf, Hans-Joachim, 5,004,886, Cl. 219-76.140.
Reuchlein, Gunter: *See*—
Erber, Anton; Hoff, Heinz; Reuchlein, Gunter; Schaaf, Hanno; and Schiessl, Gerhard, 5,003,778, Cl. 60-517.000.
Reyes, Erenio: *See*—
Bifano, Gabriel F.; and Reyes, Erenio, 5,003,743, Cl. 52-282.000.
Rezmer, Leonard D.; Kaczmarczyk, John R.; Kaczmarczyk, Gerald R.; and Kaczmarczyk, Donald J. Sealable funnel for measurement and spill prevention. 5,004,024, Cl. 141-298.000.
Rheinmetall G mbH: *See*—
Pahnke, Klaus-Dieter; Holl, Rolf; and Becker, Wilfried, 5,003,886, Cl. 102-521.000.
Rhoads, Geoffrey B.: *See*—
Falk, Timothy L.; and Rhoads, Geoffrey B., 5,005,145, Cl. 364-571.020.
Rhone-Poulenc Chimie: *See*—
Feder, Michel; and Frances, Jean-Marc, 5,004,771, Cl. 524-161.000.
Ricci, Russell L. Car ventilator. 5,003,866, Cl. 98-2.020.
Rice, Richard W., to Sundstrand Corporation. Noncontact rotating liquid film thickness sensor. 5,003,823, Cl. 73-293.000.
Ricerche Biomediche S.r.l.: *See*—
Palmieri, Beniamino; and Garlati, Rodolfo, 5,004,469, Cl. 606-139.000.
Richalley, Gerard; and Burtin, Jacques, to Hospal Industrie. Method and apparatus for rinsing and priming an exchanger. 5,004,548, Cl. 210-646.000.
Richard, Herve; Leduc, Madeleine; Forestier, Serge; and Lang, Gerard, to L'Oreal. Benzylidenecamphor sulphonamides derived from amino acids and their application in cosmetics, particularly as sunscreens. 5,004,594, Cl. 424-47.000.
Richards, Robert M., to Richards, Robert M. Blocking device for latch mechanism. 5,003,803, Cl. 70-416.000.
Richardson, William T., to Northrop Corporation. Flight helmet with headset. 5,003,631, Cl. 2-6.000.
Richeson, William E., Jr.: *See*—
Erickson, Frederick L.; and Richeson, William E., Jr., 5,003,938, Cl. 123-90.140.
Richichi, Paul: *See*—
Richichi, Thomas; and Richichi, Paul, 5,004,128, Cl. 222-527.000.
Richichi, Thomas; and Richichi, Paul. Flexi-nozzle. 5,004,128, Cl. 222-527.000.
Richter Gedeon Vegyeszeti Gyar R.T.: *See*—
Jekkel nee Bokany, Antonia; Albrecht, Karoly; Ambrus, Gabor; Lang, Tibor; Szabo, Istvan M.; Ilkoy, Eva; Konczol, Kalman; Moravcsik, Imre; Hantos, Gabor; Simonovits, Emilia; Lengyel nee Szemenyei, Zsuzsanna; Vida, Zsuzesanna; and Csajagi, Eva, 5,004,695, Cl. 435-253.100.
Ricoh Company, Ltd.: *See*—
Yagawara, Shinji; Manaka, Junji; and Ohta, Wasaburo, 5,003,812, Cl. 73-31.060.
Riddell, David: *See*—
Ashton, Michael J.; Bridge, Andrew W.; Chambers, Robert K.; Dron, Donald I.; Fenton, Garry; Harris, Neil V.; Lythgoe, David J.; McFarlane, Ian M.; Newton, Christopher G.; Riddell, David; Smith, Christopher; Stuttle, Keith A. J.; and Toft, Malcolm P., 5,004,747, Cl. 514-309.000.
Rieter Machine Works, Ltd.: *See*—
Meyer, Urs, 5,003,668, Cl. 19-0.220.
Rikio Co., Ltd.: *See*—
Okayasu, Kenji; and Okayasu, Hideo, 5,003,709, Cl. 36-107.000.
Ringel, Konrad: *See*—
Rudolf, Karl; and Ringel, Konrad, 5,003,885, Cl. 102-494.000.
Rink, Hans, to Ciba-Geigy Corporation. Synthetic polystyrene resin and its use in solid phase peptide synthesis. 5,004,781, Cl. 525-54.110.
Riordan, Dennis E. Kit containing components for an alarm screen assembly. 5,005,000, Cl. 340-550.000.
Rist, Dieter: *See*—
Kappler, Guenter; and Rist, Dieter, 5,003,768, Cl. 60-39.230.
RIV-SKF Officine di Villar Perosa S.p.A.: *See*—
Varvello, Angelo; Vignotto, Angelo; and Moretti, Roberto, 5,004,358, Cl. 384-446.000.
Rivero-Olmedo, Jose M. Meter box or meter yoke expansion mechanism. 5,003,821, Cl. 73-201.000.
RJ Lee Group, Inc.: *See*—
Lee, Richard J.; Smith, Barbara A.; Theys, Robert G.; Theys, Robert A.; and Murphy, Judy A., 5,004,920, Cl. 250-304.000.
Roach, John E.; and Parrette, Kim S. Boat hook. 5,003,907, Cl. 114-221.00R.
Robb, Stephen P.; Phipps, John P.; and Gadberry, Michael D., to Motorola, Inc. Avalanche stress protected semiconductor device having variable input impedance. 5,005,061, Cl. 357-23.130.
Robb, Wendell E.; and Hudson, William S. Foreign matter trap for shower drain. 5,003,642, Cl. 4-287.000.
Robbins, Alan K.: *See*—
Enquist, Lynn W.; Robbins, Alan K.; and Whealy, Mary E., 5,004,693, Cl. 435-235.100.
Robbins, David L. Method and apparatus for slowly dispensing a solution for unclogging drains. 5,004,025, Cl. 141-364.000.
Robert Bosch GmbH: *See*—
Vishnitsky, Alexander, 5,004,529, Cl. 204-212.000.
Roberts, John D. Fish food dispenser. 5,003,925, Cl. 119-51.040.
Roberts, John K., to K. W. Muth Company, Inc. Method and apparatus for multiple object viewing. 5,005,009, Cl. 340-705.000.
Roberts, Katherine P.; Geiger, Jon R.; and Carney, Jayne F., to Olin Corporation. Method and kit for detecting live microorganisms in chlorine- or bromine-treated water. 5,004,682, Cl. 435-6.000.
Roberts, Malcolm T.: *See*—
Robins, Michael P.; and Roberts, Malcolm T., 5,005,128, Cl. 364-424.020.
Robertson, Donald S.; and Stinard, Philip S., to Iowa State University Research Foundation, Inc. Dominant amylose-extender mutant of maize. 5,004,864, Cl. 800-235.000.
Robins, Michael P.; and Roberts, Malcolm T., to General Electric Company, p.l.c., The. Automated vehicle control. 5,005,128, Cl. 364-424.020.
Robinson, Hugh: *See*—
Kleven, Lawrence P.; Agranat, Edward A.; Crisafulli, Jerry; Robinson, Hugh; Smith, David J.; Wiseley, Thomas; Fortier, Richard C.; Johnson, Severne; and Menzin, Marvin, 5,004,954, Cl. 315-106.000.

Robinson, James P.: *See*—
Hoodenpyle, James W.; Robinson, James P.; and Wright, John W., 5,003,818, Cl. 73-121.000.
Robinson, William O.: *See*—
Moote, Richard K.; Weber, Gregory T.; and Robinson, William O., 5,003,944, Cl. 123-299.000.
Rocke, Stephen C.: *See*—
Lee, Guo-ahuh J.; Garces, Juan M.; Maj, Joseph J.; and Rocke, Stephen C., 5,004,841, Cl. 568-678.000.
Rockwell International Corporation: *See*—
Brown, Donald G.; and Onufrak, Andrew F., 5,004,205, Cl. 248-476.000.
Hall, Randolph L.; and Johnson, Christopher D., 5,004,308, Cl. 350-1.700.
Rodgers, Colin, to Sundstrand Corporation. Gas turbine starter system with power augmentation. 5,003,767, Cl. 60-39.142.
Rodriguez, Stephen S.: *See*—
D'Ottavio, Eugene D.; Hawkins, Robert E.; Rodriguez, Stephen S.; and Rychwalski, James, 5,004,672, Cl. 430-314.000.
Rohm and Haas Company: *See*—
Hallden-Abberton, Michael P.; Bortnick, Newman M.; Cohen, Leslie A.; Freed, William T.; and Fromuth, Harry C., 5,004,777, Cl. 524-433.000.
Rohrscheid, Freimund; Siegemund, Gunter; and Lau, Jurgen, to Hoechst Aktiengesellschaft. Partly fluorinated carboxylic acids and derivatives thereof, processes for their preparation and their use. 5,004,797, Cl. 528-206.000.
Roinestad, Gerald C.; and Straight, Michael R., to Ashworth Bros., Inc. Replaceable snap-on modular overlay for rod and link turn-curve conveyor belts. 5,004,097, Cl. 198-803.010.
Rolleri, Dennis A. Compact sanitary toothbrush. 5,003,658, Cl. 15-185.000.
Rollier, Michel: *See*—
Gremaud, Henri; Gremaud, Martial; and Rollier, Michel, 5,004,930, Cl. 250-561.000.
Rolls-Royce plc: *See*—
Cantwell, Hugh F., 5,003,769, Cl. 60-39.281.
England, David R., 5,004,528, Cl. 204-129.200.
Webster, John R., 5,004,059, Cl. 177-210.00R.
Roman, Thomas A.: *See*—
Berner, John M.; and Roman, Thomas A., 5,004,961, Cl. 318-65.000.
Ronchetti, Luigi: *See*—
Stroppina, Mario; and Ronchetti, Luigi, 5,005,076, Cl. 358-135.000.
Roobeek, Cornelis F.: *See*—
Van Leeuwen, Petrus W. N. M.; and Roobeek, Cornelis F., 5,004,844, Cl. 568-880.000.
Roper, W. J.: *See*—
Mallard, Bobby J.; Knapp, Richard H.; Roper, W. J.; and Harrison, Daniel R., 5,004,071, Cl. 182-3.000.
Roschmann, Peter: *See*—
Proksa, Roland; Roschmann, Peter; and van den Berg, Noel J. M., 5,004,983, Cl. 324-322.000.
Rosen, Ake, to Svecia Antiqua Limited. Light-polarizing material in the form of sheets or of a web and a method for the manufacture of the material. 5,004,327, Cl. 350-398.000.
Rosen, Karl G. Crib with vibration attenuating means. 5,003,651, Cl. 5-109.000.
Rosenbaum, Richard: *See*—
Griffin, David; Campbell, Jonathan; Reilly, Michael; and Rosenbaum, Richard, 5,005,122, Cl. 364-200.000.
Rosendahl, Finn; Fjeld, Svein; Salama, Mamdouh M.; and Gillen, Michael P., to Norwegian Contracts A/S; and Conoco Inc. Method and means for cleansing and storing drill cuttings from drilling operations in the sea bottom. 5,004,051, Cl. 166-357.000.
Rosenfield, Gary C.: *See*—
Hans, Paul C.; and Rosenfield, Gary C., 5,004,186, Cl. 244-3.250.
Rosenthal, David S.: *See*—
Hammerly, Jeffrey L.; and Rosenthal, David S., 5,004,441, Cl. 446-211.000.
Ross, Ludwig; and Schumann, Werener, to Schott Glaswerke. Lightwave guide produced from special substrate glasses by ion exchange against CS^+ ions. 5,004,707, Cl. 501-37.000.
Roth, Roger R., to Honeywell Inc. Integrated power level control and on/off function circuit. 5,004,972, Cl. 323-320.000.
Rotman, Frederic; Rancon, Yannick; Queille, Philippe; and Olivier, Michel, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Process for producing a glass-metal connection. 5,004,489, Cl. 65-32.200.
Rousseau, Andre J.: *See*—
Boulanger, Alain; and Rousseau, Andre J., 5,004,298, Cl. 299-5.000.
Roussel Uclaf: *See*—
Krief, Alain; and Dumont, Willy, 5,004,840, Cl. 568-486.000.
Rowell, Frances E. Portable resonating platform and T-bar for securing the endpin and enhancing the tone of a cello. 5,003,858, Cl. 84-280.000.
Roy, James P.; and Harris, James P. Radiator cap remover. 5,003,845, Cl. 81-3.400.
Ruane, George W. Salt truck. 5,004,164, Cl. 239-666.000.
Rudolf, Karl; and Ringel, Konrad, to Diehl GmbH & Co. Warhead for an airborne body. 5,003,885, Cl. 102-494.000.
Rudolph, Alan S.: *See*—
Schnur, Joel M.; Rudolph, Alan S.; and Testoff, Mary A., 5,004,566, Cl. 260-403.000.
Ruetz, Peter A., to LSI Logic Corporation. Compensating time delay in filtering signals of multi-dimensional reconvigurable array processors. 5,005,120, Cl. 364-200.000.
Rufray, Jean C.; and Guillon, Jean C., to Deutsche Thomson-Brandt GmbH. Demultiplexer for providing a color television signal having an increased image frequency. 5,005,073, Cl. 358-21.00R.
Rule Industries, Inc.: *See*—
Wilkinson, Bruce S., 5,003,910, Cl. 114-304.000.
Rumbaugh, James E.; and Daniel, Kenneth J., to General Electric Company. User interactive control of computer programs and corresponding versions of input/output data flow. 5,005,119, Cl. 364-200.000.
Rumpel, Manfred: *See*—
Oslapas, Algis; and Rumpel, Manfred, 5,004,063, Cl. 180-79.100.
Rumreich, Mark F.; and Parker, Robert P., to RCA Licensing Corporation. Apparatus and method thereof for improvement of stereophonic sound. 5,005,201, Cl. 381-24.000.
Rush, William B., II; Elder, Jack E.; Shier, Richard K.; Foss, Jerry B.; Haltiner, Karl J., Jr.; and Wheeler, Grant M., to General Motors Corporation. Integrated induction system. 5,003,933, Cl. 123-52.0MC.
Russo, Thomas J., to Bethlehem Steel Corporation. Molten metal slide gate valve. 5,004,131, Cl. 222-600.000.
Rutgers University: *See*—
Burdea, Grigore C., 5,004,391, Cl. 414-6.000.
Rx Rocker Corporation: *See*—
Ayers, Robert C.; and Lee, Ted, 5,004,259, Cl. 280-304.100.
Ryan, Wayne L., to Streck Laboratories, Inc. Temperature measuring apparatus. 5,004,355, Cl. 374-194.000.
Rychwalski, James: *See*—
D'Ottavio, Eugene D.; Hawkins, Robert E.; Rodriguez, Stephen S.; and Rychwalski, James, 5,004,672, Cl. 430-314.000.
Ryser, Peter; and Strassler, Sigfrid, to Cerberus AG. Method of detecting fire in an early stage. 5,005,003, Cl. 340-587.000.
Saatkamp, James B.: *See*—
McMorries, Lee W., IV; and Saatkamp, James B., 5,004,042, Cl. 165-41.000.
Saehan Media Corporation: *See*—
Lee, Jaeduck, 5,004,175, Cl. 242-68.500.
Saeijs, Ronald W. J. J.: *See*—
Van Berkel, Cornelis H.; Saeijs, Ronald W. J. J.; and Niessen, Cornelius, 5,005,136, Cl. 364-490.000.
Saijo, Yasutsugu; Chiku, Kazuyoshi; and Onoda, Shigeyoshi, to Canon Kabushiki Kaisha. Transmissive original projecting apparatus. 5,004,336, Cl. 353-122.000.
St. Clair, Terry L.: *See*—
Johnston, Norman J.; St. Clair, Terry L.; Baucom, Robert M.; and Gleason, John R., 5,004,575, Cl. 264-136.000.
Saint-Gobain Vitrage: *See*—
Kawahara, Hideo; Sakata, Nobuhiro; Coulon, Jean-Claude; and Lovera, Patrick, 5,004,503, Cl. 106-287.180.
Saito, Hiroki: *See*—
Terai, Fumitaka; Yukawa, Kimio; Suyefuji, Mineo; Saito, Hiroki; and Yamaguchi, Shigeru, 5,004,628, Cl. 427-389.900.
Saito, Kenji: *See*—
Nishimura, Yukuo; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Nakagiri, Takashi; Saito, Kenji; Kimura, Toshiaki; Matsuda, Hiroshi; Sakai, Kunihiro; and Miyazaki, Toshihiko, 5,004,671, Cl. 430-286.000.
Saito, Yoshio: *See*—
Miyata, Yukihide; Ishizaka, Hideo; Saito, Yoshio; and Koizumi, Takashi, 5,004,582, Cl. 422-56.000.
Sajo, Gabor: *See*—
Kinczel, Peter; Balazs, Laszlo ; and Sajo, Gabor, 5,004,948, Cl. 313-486.000.
Saka, Kazuhito: *See*—
Iura, Kazuo; Tsuji, Kazunori; and Saka, Kazuhito, 5,003,761, Cl. 57-58.520.
Saka, Kenji; Terai, Masao; and Yamamoto, Kanji, to Kanebo, Ltd. Suction device. 5,003,966, Cl. 128-39.000.
Sakaguchi, Hiroaki: *See*—
Aramaki, Minoru; Suenaga, Takashi; Sakaguchi, Hiroaki; and Hamana, Takanori, 5,004,829, Cl. 562-113.000.
Sakaguchi, Shuichi; Yamaguchi, Tadamasa; and Yamashita, Itaru, to Kawasaki Steel Corporation. Method of submerged arc welding a thick steel plate with large heat input and submerged arc welding flux. 5,004,884, Cl. 219-73.000.
Sakai, Katsuyuki, to Sharp Kabushiki Kaisha. Thermal head separating mechanisms. 5,005,026, Cl. 346-76.0PH.
Sakai, Kunihiro: *See*—
Nishimura, Yukuo; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Nakagiri, Takashi; Saito, Kenji; Kimura, Toshiaki; Matsuda, Hiroshi; Sakai, Kunihiro; and Miyazaki, Toshihiko, 5,004,671, Cl. 430-286.000.
Sakai, Shinji: *See*—
Fukushima, Nobuo; Sakai, Shinji; Takdea, Osamu; Takei, Masahiro; Suzuki, Yasutomo; Okino, Tadashi; and Jinnai, Shigeru, 5,005,088, Cl. 360-69.000.
Sakaida, Atsuo; Ikezaki, Yoshiyuki; Iriguchi, Akira; and Inose, Toshio, to Brother Kogyo Kabushiki Kaisha. Parallel four-link mechanism. 5,004,946, Cl. 310-328.000.
Sakakibara, Shiro; and Furuya, Takashi, to Aisin AW Co., Ltd. Starting device of an automatic transmission for vehicle. 5,004,082, Cl. 192-3.260.
Sakamoto, Masanori: *See*—
Abe, Kunihiro; Sakamoto, Masanori; and Kobayashi, Tomoya, 5,005,129, Cl. 364-424.030.

Sakamoto, Noriaki; Maeda, Shigemi; Yamanaka, Toshihiro; Deguchi, Toshihisa; Horie, Nobuyuki; Yamaguchi, Takeshi; and Kojima, Kunio, to Sharp Kabushiki Kaisha. Recording and reproducing apparatus. 5,005,164, Cl. 369-48.000.

Sakata, Nobuhiro: *See*—
Kawahara, Hideo; Sakata, Nobuhiro; Coulon, Jean-Claude; and Lovera, Patrick, 5,004,503, Cl. 106-287.180.

Sakata, Yasushi; and Iwamori, Toshimichi, to Fuji Xerox Co., Ltd. Semiconductor integrated circuit. 5,005,067, Cl. 357-54.000.

Sakaue, Kenji: *See*—
Kano, Atsushi; Mizuno, Masayuki; Kajiwara, Manabu; Sakaue, Kenji; Abe, Yuji; and Nakamura, Kazuo, 5,004,217, Cl. 271-10.000.

Sakura Color Products Corporation: *See*—
Imagawa, Kiyotaka, 5,004,763, Cl. 523-161.000.

Salaba, Timothy A.; and Wilfong, Debra L., to Minnesota Mining & Manufacturing Company. Reaction injection molding machine. 5,004,351, Cl. 366-152.000.

Salama, Mamdouh M.: *See*—
Rosendahl, Finn; Fjeld, Svein; Salama, Mamdouh M.; and Gillen, Michael P., 5,004,051, Cl. 166-357.000.

Salek, Jeffrey S.: *See*—
Pugach, Joseph; and Salek, Jeffrey S., 5,004,839, Cl. 568-390.000.

Salloum, James S., to Creative Techniques, Inc. Molded sectional reel. 5,004,179, Cl. 242-118.600.

Salman, Naser N.: *See*—
Azer, Samir N.; Salman, Naser N.; and Krause, William R., 5,003,969, Cl. 128-87.00R.

Salomon S.A.: *See*—
Goud, Gilles R., 5,004,065, Cl. 280-605.000.
Nerrinck, Bernard; and Bonnet, Maurice, 5,003,711, Cl. 36-120.000.
Provence, Marc; and Graillat, Gerard, 5,004,262, Cl. 280-615.000.

Salzmann, Thomas N.: *See*—
DiNinno, Frank P.; Greenlee, Mark L.; and Salzmann, Thomas N., 5,004,739, Cl. 514-210.000.
Dininno, Frank P.; Salzmann, Thomas N.; and Greenlee, Mark L., 5,004,740, Cl. 514-210.000.

Samad, Raphael; and Gillard, Clive H., to Sony Corporation. Motion dependent video signal processing. 5,005,077, Cl. 358-140.000.

Samata, Shuichi; and Matsushita, Yoshiaki, to Kabushiki Kaisha Toshiba. Preparation method of selective growth silicon layer doped with impurities. 5,004,702, Cl. 437-57.000.

Sample, Hugh D.: *See*—
Hollowell, George E.; and Sample, Hugh D., 5,004,132, Cl. 223-1.000.

Sampson, Edward J., to Shiley Infusaid, Inc. Implantable device. 5,004,458, Cl. 604-175.000.

Samsung Electron Devices Co., Ltd.: *See*—
Lee, Seung-Woo, 5,004,950, Cl. 313-582.000.

Samsung Electronics Co., Ltd.: *See*—
Kwon, Oh-Hyun; Jang, Taek-Yong; Shin, Jung-Hyun; and Choi, Won-Taek, 5,005,103, Cl. 361-313.000.

Sanada, Kazunori; and Kawai, Jyoji, to Mitsubishi Denki Kabushiki Kaisha. Phase-locked loop circuit. 5,005,141, Cl. 364-550.000.

Sandt, Hartley. Method of making a composite structural element. 5,004,574, Cl. 264-101.000.

Sano, Eiichi: *See*—
Ohtani, Junji; Anno, Masahiro; Sano, Eiichi; Machida, Junji; and Masuda, Fumio, 5,004,665, Cl. 430-106.600.

Sano, Hiroshi: *See*—
Yasuzawa, Toru; Nakanishi, Satoshi; Murakata, Chikara; Kase, Hiroshi; Sano, Hiroshi; and Yamada, Koji, 5,004,833, Cl. 536-18.200.

Sano, Hisanori: *See*—
Honda, Kazuo; Matsuura, Atsushi; and Sano, Hisanori, 5,004,951, Cl. 313-631.000.

Sano, Yasuro: *See*—
Hara, Kazumasa; Sano, Yasuro; Koike, Mikio; and Nishijima, Mitsuru, 5,003,896, Cl. 112-121.110.

Sanshin Kogyo Kabushiki Kaisha: *See*—
Onoue, Akihiro, 5,004,439, Cl. 440-2.000.

Sansone, Ronald P.: *See*—
Connell, Richard A.; Keating, Raymond; Sansone, Ronald P.; and Schumacher, Karl H., 5,005,124, Cl. 364-401.000.

Santa Barbara Research Center: *See*—
Norton, Paul R.; Moroz, Michael; and Talley, Carol S., 5,004,698, Cl. 437-3.000.

Santrade Limited: *See*—
Hessman, Ingemar; Post, Karl G. Y.; and Norgren, Lars E., 5,004,380, Cl. 407-114.000.

Sanyo Electric Co., Ltd.: *See*—
Ohtuka, Nobuo; and Matsumoto, Kouichi, 5,005,113, Cl. 363-37.000.
Satomi, Hideo, 5,005,079, Cl. 358-158.000.

Sardano, Peter A.; and Kazmierczak, Irvin J., to Xerox Corporation. Retard feeder with pivotal nudger ski for reduced smudge. 5,004,218, Cl. 271-35.000.

Sargent & Greenleaf, Inc.: *See*—
Beatty, Scott M.; and Bishop, John R., 5,003,802, Cl. 70-333.00A.

Sarno, Felicisimo S.: *See*—
Koschak, Francis L.; and Sarno, Felicisimo S., 5,004,624, Cl. 426-623.000.

Sarno, Russell J., to Magic Plastics. Gate valve. 5,004,210, Cl. 251-279.000.

Sasaki, Katsuro: *See*—
Ikeda, Shuji; Sasaki, Katsuro; Nagasawa, Kouichi; and Meguro, Satoshi, 5,005,068, Cl. 357-59.000.

Sasaki, Kenichi, to Canon Kabushiki Kaisha. Magneto-optical information reproducing apparatus having a polarizing beam splitter disposed with an inclination of 45 degrees. 5,004,326, Cl. 350-375.000.

Sasatani, Seiei: *See*—
Kim, Soonih; Takeda, Kazuhisa; and Sasatani, Seiei, 5,004,612, Cl. 424-450.000.

Sase, Toshitsugu; Matsuda, Michiaki; Yanagisawa, Kiyoshi; and Maeda, Mitsuru, to Ebara Corporation. Muffler. 5,004,068, Cl. 181-276.000.

Sato, Hiroshi; Hirose, Kenichi; Nagai, Koichi; Yoshioka, Hiroshi; and Nagaoka, Yoshihiko, to Sumitomo Chemical Company, Ltd. Process for producing nitrobenzenes. 5,004,846, Cl. 568-940.000.

Sato, Keiichi: *See*—
Shigenai, Osamu; and Sato, Keiichi, 5,005,092, Cl. 360-99.060.

Sato, Kimiharu: *See*—
Hayashi, Minoru; Kobari, Koichi; Sato, Kimiharu; and Kishimoto, Junichi, 5,004,586, Cl. 422-164.000.

Sato, Kiyoshi; Yoshikawa, Hirokazu; Ikenari, Shigeru; and Yokoyama, Kenichi, to Hitachi Maxell, Ltd. Flat type sealed battery with hermetic sealing structure. 5,004,656, Cl. 429-162.000.

Sato, Koichi: *See*—
Takahashi, Hiroto; Karita, Seiichiro; and Sato, Koichi, 5,005,024, Cl. 346-1.100.

Sato, Masayuki: *See*—
Tomono, Makoto; Tarumi, Noriyoshi; and Sato, Masayuki, 5,004,666, Cl. 430-110.000.

Sato, Osamu; and Hirai, Isamu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electric control camera. 5,005,042, Cl. 354-412.000.

Sato, Shin: *See*—
Yoneda, Tetsuya; and Sato, Shin, 5,004,657, Cl. 429-193.000.

Sato, Shuichi; and Kobayashi, Yoshiharu, to SSMC Inc. Feeding rate adjusting unit of a sewing machine. 5,003,901, Cl. 112-316.000.

Sato, Teiji: *See*—
Ogawa, Masahide; Sato, Teiji; Tanaka, Masanori; and Takahashi, Noriyuki, 5,004,716, Cl. 501-141.000.

Sato, Tsuyoshi; Inaba, Masahito; and Takata, Naoya, to Minolta Camera Kabushiki Kaisha. Lighting apparatus and color measuring apparatus using the same. 5,004,349, Cl. 356-402.000.

Satoh, Susumu: *See*—
Sunagawa, Masao; Kubota, Kazuhiro; Ishii, Yoshitaro; and Satoh, Susumu, 5,003,663, Cl. 15-366.000.

Satoh, Toshio; Niiro, Yasunori; Kakegawa, Hisao; and Matsumoto, Hitoshi, to Nippon Hypox Laboratories Incorporated. Benzothiazine-1,1-dioxide derivatives. 5,004,742, Cl. 514-226.500.

Satoh, Yasuta; and Moriyama, Yasuyuki, to Takara Co., Ltd. Figure moving article. 5,003,714, Cl. 40-414.000.

Satomi, Hideo, to Sanyo Electric Co., Ltd. Automatic frequency control circuit. 5,005,079, Cl. 358-158.000.

Sauer-Sundstrand S.p.A.: *See*—
Zanardi, Angelo; Mei, Daniele; and Toselli, Vittorio, 5,004,412, Cl. 418-132.000.

Saulas, Alain, to Mead Corporation, The. Multi-unit package particularly for parallelepiped cartons. 5,004,104, Cl. 206-526.000.

Savant Instruments: *See*—
Zlobinsky, Yury, 5,003,787, Cl. 62-185.000.

Savio S.p.A.: *See*—
Colli, Luigi; Badiali, Roberto; and Marangone, Nereo, 5,004,171, Cl. 242-35.60R.

Sawada, Shizuo: *See*—
Maeda, Satoshi; and Sawada, Shizuo, 5,004,704, Cl. 437-195.000.

Sawyer, Thomas F., to General Electric Company. Melt system for spray-forming. 5,004,153, Cl. 239-81.000.

Scaglia, Enzo. Automatic feeder and feeding method for textile machines. 5,003,762, Cl. 57-281.000.

Scamans, Geoffrey M.: *See*—
Hunter, John A.; Scamans, Geoffrey M.; O'Callaghan, Wilfred B.; and Wycliffe, Paul A., 5,004,654, Cl. 429-50.000.

Schaaf, Hanno: *See*—
Erber, Anton; Hoff, Heinz; Reuchlein, Gunter; Schaaf, Hanno; and Schiessl, Gerhard, 5,003,778, Cl. 60-517.000.

Schaap, Arthur P., to Board of Governors of Wayne State University, The. Method and compositions providing enhanced chemiluminescence from 1,2-dioxetanes. 5,004,565, Cl. 252-700.000.

Schadt, Martin: *See*—
Leenhouts, Frans; and Schadt, Martin, 5,004,324, Cl. 350-347.00R.

Schaefer, Dietmar: *See*—
Koerner, Gotz; and Schaefer, Dietmar, 5,004,559, Cl. 252-345.000.

Schammel, Wayne P.: *See*—
Park, Chang M.; and Schammel, Wayne P., 5,004,830, Cl. 562-413.000.

Schanin, David J., to Bayview Technology Group, Inc. Phase control switching circuit without zero crossing detection. 5,004,969, Cl. 323-235.000.

Schap, William W., to ITT Corporation. Variable power drive for sliding door. 5,004,280, Cl. 292-341.160.

Schauder, Colin D., to Westinghouse Electric Corp. Forced-commutated current-source converter and AC motor drive using the same. 5,005,115, Cl. 363-159.000.

Schaul, Malcolm: *See*—
Broderick, James; and Schaul, Malcolm, 5,004,270, Cl. 283-48.100.

Schegerin, Robert; Laboure, Bernard; and Standish, Robert, to Societe de Construction des Avions Hurel-Bubois. Thrust reverser for a jet engine of the type with doors equipped with auxiliary flaps. 5,003,770, Cl. 60-226.200.

Schekin, Vladimir I.: *See*—
Sizonenko, Olga N.; Maxutov, Rafkhat A.; Maljushevsky, Pavel P.; Gorovenko, Georgy G.; Sokolov, Alexei V.; Lyapis, Diana N.; Schekin, Vladimir I.; and Kuskova, Natalya I., 5,004,050, Cl. 166-248.000.

Scher, Richard K. Method of treating nails. 5,004,599, Cl. 424-61.000.

Scherer, Peter. Cylinder of an internal combustion engine having variable volume. 5,003,936, Cl. 123-78.0AA.

Schering Aktiengesellschaft: *See*—
Blaszkiewicz, Peter; and Speck, Ulrich, 5,004,835, Cl. 564-153.000.
Raduechel, Bernd; Skuballa, Werner; Vorbrueggen, Helmut; Loge, Olaf; and Schilliner, Ekkehard, 5,004,752, Cl. 514-530.000.

Schering Corporation: *See*—
Draper, Kenneth G., 5,004,810, Cl. 536-27.000.

Scheurer, Robert S.: *See*—
Sullivan, John F., 5,004,283, Cl. 294-61.000.

Schiel, Christian; and Hafner, Paul, to J. M. Voith GmbH. Cylinder-piston unit for displacing a roll at right angles to its longitudinal axis. 5,003,863, Cl. 92-61.000.

Schiessl, Gerhard: *See*—
Erber, Anton; Hoff, Heinz; Reuchlein, Gunter; Schaaf, Hanno; and Schiessl, Gerhard, 5,003,778, Cl. 60-517.000.

Schilliner, Ekkehard: *See*—
Raduechel, Bernd; Skuballa, Werner; Vorbrueggen, Helmut; Loge, Olaf; and Schilliner, Ekkehard, 5,004,752, Cl. 514-530.000.

Schimpf, Warren C., to Hercules Incorporated. Carbon fibers. 5,004,590, Cl. 425-447.200.

Schlett, Eugene: *See*—
Spinger, J. William; and Schlett, Eugene, 5,004,389, Cl. 411-304.000.

Schley, Paul E. Brake tool. 5,003,681, Cl. 29-239.000.

Schlueter, Rudolf: *See*—
Wahl, Hans-Peter; Schlueter, Rudolf; Kaettlitz, Wolfgang; and Loos, Rolf, 5,004,545, Cl. 210-510.100.

Schmidt, Kenneth D.; and Holt, Jan D., to ACF Industries, Inc. Protective cover for railcar hitch. 5,004,386, Cl. 410-62.000.

Schmidt, Konrad; and Kramer, Ralf, to U.S. Philips Corporation. Hybrid phase-locked loop. 5,005,016, Cl. 341-142.000.

Schmidt, Robert J.; Haizmann, Robert S.; Ford, Mark R.; Low, C. David; and Adams, Frank H., to UOP. Catalyst for the isomerization of alkanes. 5,004,859, Cl. 585-741.000.

Schmitt, Marcella H. Portable, safety, play chair. 5,004,297, Cl. 297-270.000.

Schmitt, Wayne I.: *See*—
Natho, Bradford J.; Andrade, George L.; Wheaton, John M.; and Schmitt, Wayne I., 5,004,091, Cl. 190-18.00R.

Schmitz, Gunter: *See*—
Ackermann, Wilhelm; Langlitz, Karlheinz; and Schmitz, Gunter, 5,003,835, Cl. 74-411.000.

Schneider, Paul L.: *See*—
Chalupa, William; Kronfeld, David S.; Schneider, Paul L.; and Sklan, David, 5,004,728, Cl. 514-12.000.

Schneider (USA) Inc.: *See*—
Edelman, William; Constantinou, Dennis; Stefanovski, Miles; Jan, Yuh L.; Fahlen, Theodore S.; Hansen, Ronald L.; and Kramasz, Kenneth J., 5,005,180, Cl. 372-57.000.

Schnur, Joel M.; Rudolph, Alan S.; and Testoff, Mary A., to Geo-Centers, Inc. Process for fabrication of lipid microstructures from dry organic solvent. 5,004,566, Cl. 260-403.000.

Schnut, Robert H., to Eaton Corporation. Plural set point pressure responsive switching apparatus utilizing a single pressure sensing driver element. 5,004,873, Cl. 200-83.00P.

Scholz, Bernd: *See*—
Dethlefs, Ralf-Burkhard; Scholz, Bernd; Wysk, Wolfram; and Miefert, Elke, 5,004,644, Cl. 428-323.000.

Schon, Steven G.; and Hazbun, Edward A., to Arco Chemical Technology, Inc. Methanol as cosurfactant for microemulsions. 5,004,479, Cl. 44-302.000.

Schott Glaswerke: *See*—
Ross, Ludwig; and Schumann, Werener, 5,004,707, Cl. 501-37.000.

Schreckenberg, Manfred: *See*—
Blum, Harald; Meixner, Jurgen; Schreckenberg, Manfred; Fleiter, Lothar; and Wellner, Wolfgang, 5,004,779, Cl. 524-591.000.

Schroeder, Manfred: *See*—
Wislinski, Martin; Bergquist, Roger; Schroeder, Manfred; Weir, Theodore; Monetti, Matthew; and Fung, Paul, 5,004,579, Cl. 264-517.000.

Schroeder, Rodney G.; and Sharangpani, Anand S. G., to BASF. Transparent iron oxide pigments. 5,004,504, Cl. 106-456.000.

Schubert, Burton L., to Schubert Farms, Inc. Distance measuring device and method for use with vehicles. 5,003,704, Cl. 33-775.000.

Schubert Farms, Inc.: *See*—
Schubert, Burton L., 5,003,704, Cl. 33-775.000.

Schuh, Paul A.: *See*—
Mehr-Ayin, Kourosh; and Schuh, Paul A., 5,004,084, Cl. 192-0.033.

Schulte, Helmut, to Luhn & Pulvermacher GmbH & Co. Leaf-spring hardener. 5,004,213, Cl. 266-116.000.

Schulz, Hans E.; Braas, Jurgen; and Echl, Friedrich, to Braas & Co. GmbH. Apparatus for producing concrete roof tiles. 5,004,415, Cl. 425-297.000.

Schumacher, Dean P.; Blume, William F.; and Bonds, John C. Method and apparatus for playing a game. 5,004,245, Cl. 273-241.000.

Schumacher, Karl H.: *See*—
Connell, Richard A.; Keating, Raymond; Sansone, Ronald P.; and Schumacher, Karl H., 5,005,124, Cl. 364-401.000.

Schumann, Werener: *See*—
Ross, Ludwig; and Schumann, Werener, 5,004,707, Cl. 501-37.000.

Schwan-Stabilo Schwanhausser GmbH & Co.: *See*—
Huttner, Gerhard; Kruckel, Peter; and Mock, Gerhard, 5,004,363, Cl. 401-75.000.

Schwappach, Dieter, to O&K Orenstrein & Koppel Aktiengesellschaft. Attachment holder for interchangeable equipment on the superstructure of a mobile shovel excavator. 5,004,397, Cl. 414-686.000.

Schwarz, Karl H.: *See*—
Bernard, Walter; Heppner, Joachim G.; and Schwarz, Karl H., 5,004,342, Cl. 356-350.000.

Scott, Hugh: *See*—
Porritt, John; and Scott, Hugh, 5,004,055, Cl. 175-20.000.

Scott, Raymond J.: *See*—
Montierth, Garry L.; Logan, Stephen A.; and Scott, Raymond J., 5,004,190, Cl. 246-428.000.

Scully, Sean: *See*—
Connors, Peter J.; Scully, Sean; Bria, Frank; and ReFalo, John, III, 5,004,103, Cl. 206-372.000.

Sebag, Henri: *See*—
Philippe, Michel; and Sebag, Henri, 5,004,729, Cl. 514-29.000.
Philippe, Michel; and Sebag, Henri, 5,004,730, Cl. 514-029.000.
Philippe, Michel; and Sebag, Henri, 5,004,731, Cl. 514-29.000.
Philippe, Michel; and Sebag, Henri, 5,004,732, Cl. 514-29.000.
Philippe, Michel; and Sebag, Henri, 5,004,733, Cl. 514-029.000.
Philippe, Michel; and Sebag, Henri, 5,004,734, Cl. 514-29.000.

Secoolish, Ronald H.: *See*—
Dutcher, Davy L.; and Secoolish, Ronald H., 5,003,723, Cl. 43-42.130.

Seeburger, Rolf: *See*—
Goessler, Gerhard; Wilde, Eugen; and Seeburger, Rolf, 5,004,892, Cl. 219-464.000.

Segerpalm, Hans; and Eklund, Ante, to Swede Space Design AB. Arrangement for displaceable supporting articles of furniture. 5,004,304, Cl. 312-201.000.

Segrestin, Pierre: *See*—
Vidal, Henri; Muelas-Medrano, Santiago; and Segrestin, Pierre, 5,004,376, Cl. 405-284.000.

Seibu Electric and Machinery Co., Ltd.: *See*—
Tsubone, Akira; Tomiyoshi, Masanori; Yokomizo, Junichi; Tanaka, Nobuhiro; Moriguchi, Hideyuki; and Hirata, Eiji, 5,004,401, Cl. 414-786.000.

Seiko Epson Corporation: *See*—
Kobayashi, Atsushi; Suzuki, Takashi; and Kosugi, Yasuhiko, 5,005,043, Cl. 355-27.000.

Seikosha Co., Ltd.: *See*—
Motai, Noboru; Tanaka, Sakae; and Watanabe, Yoshiaki, 5,005,056, Cl. 357-2.000.

Sekida, Minoru: *See*—
Fujino, Akihiko; Inoue, Manabu; Omaki, Takanobu; Nakai, Masaaki; Fujii, Akira; and Sekida, Minoru, 5,005,047, Cl. 354-442.000.

Sela, Uri: *See*—
Baker, Charles L.; Cody, George D.; Joseph, Craig A.; and Sela, Uri, 5,004,152, Cl. 239-8.000.

Selga, Betty J. Reusable fabric gift wrap. 5,004,144, Cl. 229-87.190.

Sellar, John G. Apparatus for employing destructive resonance. 5,004,166, Cl. 241-36.000.

Selman, Willis M., Jr. Toilet lid safety lock. 5,003,641, Cl. 4-253.000.

Seltzer, Raymond: *See*—
Cortolano, Frank P.; Seltzer, Raymond; and Patel, Ambelal R., 5,004,770, Cl. 524-99.000.

Sensormatic Electronics Corporation: *See*—
Farrar, James G.; and Eskandry, Ezra D., 5,005,125, Cl. 364-403.000.

Sentrol, Inc.: *See*—
Bernhardt, Everett A.; and Winters, Robert C., 5,004,879, Cl. 200-295.000.

Seo, Nobuyuki: *See*—
Ida, Tomoyasu; Nohara, Makoto; and Seo, Nobuyuki, 5,004,980, Cl. 324-166.000.

Serrell, Robert; Smith, J. Lamar; and Kurst, Frederick L., to Educational Testing Service. Optical document scanning and mark sensing. 5,004,896, Cl. 235-437.000.

Seto, Nobuo; and Morigaki, Masakazu, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 5,004,678, Cl. 430-548.000.

Seton Health Care Foundation: *See*—
Muckerheide, Myron C., 5,005,182, Cl. 372-72.000.

Settles, David J., to Dayco Products-Eaglemotive, Inc. Method of making a clutch for a cooling fan of a motor vehicle. 5,003,685, Cl. 29-525.000.

Sevier, Richard W.; and Keenan, James J., to Hendry Mechanical Works. Earthquake braced racks. 5,004,107, Cl. 211-26.000.

Seya, Masatomo; Tadokoro, Michihiro; and Okada, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Focusing error detecting apparatus with light switching and detector sampling. 5,004,900, Cl. 250-201.500.

Seymour, Raymond K.; Hart, Marshall B.; Magnon, Gary D.; von Kannewurff, Michael C.; and Doughty, Dennis J., to General Electric Company. Molded case circuit breaker movable contact arm arrangement. 5,004,878, Cl. 200-144.00R.

Seynhaeve, Andre, to Delsey S.A. Device for affixing the straps of articles of luggage. 5,003,671, Cl. 24-265.00A.

SGS-Thomson Microelectronics, Inc.: *See*—
McClure, David C.; and Lysinger, Mark A., 5,005,158, Cl. 365-200.000.

O'Connor, James T.; and Courtright, David A., 5,005,191, Cl. 375-116.000.
SGS-Thomson Microelectronics S.r.l.: *See*—
Cardani, Silvestro; and Pareschi, Flavio, 5,003,999, Cl. 134-105.000.
Mazzali, Stefano, 5,005,060, Cl. 357-23.500.
SGS-Thomson Microelectronics S.A.: *See*—
Barou, Michel, 5,004,970, Cl. 323-277.000.
Shah, Gautam P., to W. R. Grace & Co.-Conn. Oxygen barrier biaxially oriented film. 5,004,647, Cl. 428-349.000.
Shah, Tushar K.: *See*—
Engdahl, Gerald E.; and Shah, Tushar K., 5,003,784, Cl. 62-124.000.
Shamir, Joseph: *See*—
Caulfield, H. John; Hester, Charles F.; Kinser, Jason M.; and Shamir, Joseph, 5,004,309, Cl. 350-3.680.
Shanbhag, Sudhakar P.; Cousminer, Joseph J.; and Milani, Gerald, to Horizons International Foods, Inc. Process for preparing microwave-reheatable french fried potatoes and product thereof. 5,004,616, Cl. 426-102.000.
Shannon, Leland K.; Gentry, Ted L.; and Le, Toby, to Cubic Defense Systems. Shock testing apparatus. 5,003,811, Cl. 73-12.000.
Sharangpani, Anand S. G.: *See*—
Schroeder, Rodney G.; and Sharangpani, Anand S. G., 5,004,504, Cl. 106-456.000.
Sharp Kabushiki Kaisha: *See*—
Furuta, Kouichi, 5,004,934, Cl. 307-303.000.
Kugimiya, Shuzo; Fukumochi, Yoji; Nakamura, Ichiko; Hirai, Tokuyuki; and Suzuki, Hitoshi, 5,005,127, Cl. 364-419.000.
Sakai, Katsuyuki, 5,005,026, Cl. 346-76.0PH.
Sakamoto, Noriaki; Maeda, Shigemi; Yamanaka, Toshihiro; Deguchi, Toshihisa; Horie, Nobuyuki; Yamaguchi, Takeshi; and Kojima, Kunio, 5,005,164, Cl. 369-48.000.
Toda, Manabu, 5,005,198, Cl. 379-58.000.
Webb, Brian C.; Pedley, Derek G.; Prosser, Stephen J.; Hijikigawa, Masaya; and Furubayashi, Hisatoshi, 5,004,700, Cl. 437-42.000.
Yamanaka, Toshihiro; Maeda, Shigemi; and Horie, Nobuyuki, 5,005,165, Cl. 369-58.000.
Yoneda, Tetsuya; and Sato, Shin, 5,004,657, Cl. 429-193.000.
Yoshinouchi, Atsushi; Itoh, Masataka; and Tsuchimoto, Shuhei, 5,004,905, Cl. 250-208.100.
Shaughnessy, Terry P.: *See*—
Berkley, Robert D.; and Shaughnessy, Terry P., 5,003,722, Cl. 43-3.000.
Shaulov, Avner A.; Herko, Samuel P.; Dorman, Donald R.; and Bhargava, Rameshwar N., to North American Philips Corp. Apparatus and methodology for the non-contact testing of materials for superconductivity by detecting odd harmonics above a threshold. 5,004,726, Cl. 505-1.000.
Shaw, Scott W.: *See*—
Krishen, Kumar; Shaw, Scott W.; and deFigueiredo, Rui J. P., 5,005,147, Cl. 364-578.000.
Shaw-Walker Company, The: *See*—
Dull, Raymond P.; Lavas, Bernard R.; and Baxter, William D., 5,003,740, Cl. 52-239.000.
Sheen, Dony, to Regitar Power Tools Co., Ltd. Electric drill with speed and torque control. 5,004,054, Cl. 173-12.000.
Sheldahl, Inc.: *See*—
Desai, Jay, 5,004,639, Cl. 428-138.000.
Shell Oil Company: *See*—
Kipp, Robert M., 5,004,272, Cl. 285-24.000.
Van Leeuwen, Petrus W. N. M.; and Roobeek, Cornelis F., 5,004,844, Cl. 568-880.000.
Shellhause, Ronald L. Fluidic valve mechanism. 5,003,780, Cl. 60-585.000.
Shepherd, James E. Saw chain holding mechanism for grinding machines. 5,003,843, Cl. 76-78.100.
Sherby, James E., to PPG Industries, Inc. Support system for abrasive jet cutting. 5,003,729, Cl. 51-283.00R.
Sherwin-Williams Company, The: *See*—
Mathai, John, 5,004,828, Cl. 560-224.000.
Shetterly, Donivan M.: *See*—
McMaster, Ronald A.; and Shetterly, Donivan M., 5,004,491, Cl. 65-106.000.
Shiba, Haruo: *See*—
Okamura, Masatoshi; Namioka, Takashi; and Shiba, Haruo, 5,004,180, Cl. 242-198.000.
Shibata, Katsuhiro; Azuma, Yuichi; and Suzuki, Tsuguya, to Honda Giken Kogyo Kabushiki Kaisha. Friction material. 5,004,497, Cl. 75-229.000.
Shibata, Masanori; Okimoto, Haruo; Akagi, Toshimichi; and Tashima, Seiji, to Mazda Motor Corporation. Air supply and exhaust control systems for turbocharged internal combustion engines. 5,003,781, Cl. 60-600.000.
Shibata, Seiichi. Method for preparation of nephritogenoside. 5,004,818, Cl. 530-322.000.
Shibata, Shinya: *See*—
Ogawa, Masanobu; and Shibata, Shinya, 5,005,020, Cl. 343-713.000.
Shibazaki, Toshiji; Okano, Masaru; Kishida, Naoto; Ozaki, Yoshihiro; and Iyama, Kunihiko, to Toyo Denso Kabushiki Kaisha. Hydraulic actuating apparatus. 5,004,996, Cl. 338-36.000.
Shields, Michael R. Animal training collar. 5,003,930, Cl. 119-106.000.
Shier, Richard K.: *See*—
Rush, William B., II; Elder, Jack E.; Shier, Richard K.; Foss, Jerry B.; Haltiner, Karl J., Jr.; and Wheeler, Grant M., 5,003,933, Cl. 123-52.0MC.
Shigenai, Osamu; and Sato, Keiichi, to Alps Electric Co., Ltd. Shutter opening device. 5,005,092, Cl. 360-99.060.
Shigyo, Masao: *See*—
Shimizu, Kunimasa; Shigyo, Masao; and Tanaka, Hiroshi, 5,004,917, Cl. 250-236.000.
Shiley Infusaid, Inc.: *See*—
Sampson, Edward J., 5,004,458, Cl. 604-175.000.
Shimamoto, Mamoru: *See*—
Kozaki, Tetsuji; Ishikawa, Hiroshi; Yasui, Hideaki; Shimamoto, Mamoru; Hibino, Katsuhiko; and Suzuki, Motoshi, 5,004,264, Cl. 280-707.000.
Shimamura, Keizo; Amano, Kagetaka; Aisaka, Tatsuryoshi; Hanai, Satoshi; and Nagata, Kohsoku, to Kabushiki Kaisha Toshiba. Dispersion strengthened copper alloy and a method of manufacturing the same. 5,004,498, Cl. 75-233.000.
Shimano Industrial Co., Ltd.: *See*—
Nagano, Masashi, 5,003,841, Cl. 74-594.400.
Shimizu, Chiyuki: *See*—
Nagaoka, Hisayuki; Zenbayashi, Michio; and Shimizu, Chiyuki, 5,004,793, Cl. 528-15.000.
Shimizu, Haruhito, to NEC Corporation. Method for controlling a polarization of light. 5,004,312, Cl. 350-96.130.
Shimizu, Kunimasa; Shigyo, Masao; and Tanaka, Hiroshi, to Fuji Photo Film Co., Ltd. Radiation image information reading apparatus. 5,004,917, Cl. 250-236.000.
Shimizu, Masataka: *See*—
Terada, Nobuhiro; Shimizu, Masataka; and Matsuzawa, Soichiro, 5,003,688, Cl. 29-603.000.
Shimoda, Kyouji: *See*—
Yoshimoto, Kyosuke; and Shimoda, Kyouji, 5,004,901, Cl. 250-201.500.
Shin-Etsu Chemical Co., Ltd.: *See*—
Takaoka, Akio; and Inomata, Hiroshi, 5,004,824, Cl. 556-412.000.
Shin, Jung-Hyun: *See*—
Kwon, Oh-Hyun; Jang, Taek-Yong; Shin, Jung-Hyun; and Choi, Won-Taek, 5,005,103, Cl. 361-313.000.
Shinagawa Fuel Co., Ltd.: *See*—
Miyake, Teruyoshi; and Yamamoto, Tatsuo, 5,003,638, Cl. 2-167.000.
Shinanen New Ceramic Corporation: *See*—
Miyake, Teruyoshi; and Yamamoto, Tatsuo, 5,003,638, Cl. 2-167.000.
Shipley Company Inc.: *See*—
Bernards, Roger F.; Fisher, Gordon; and Sonnenberg, Wade, 5,004,525, Cl. 204-52.100.
D'Ottavio, Eugene D.; Hawkins, Robert E.; Rodriguez, Stephen S.; and Rychwalski, James, 5,004,672, Cl. 430-314.000.
Shiseido Company Ltd.: *See*—
Hayashi, Shigeru; and Yamada, Kaneo, 5,004,609, Cl. 424-94.300.
Shisgal, Ben Z.; and Tzelnick, Tzvi, to Insys Ltd. Parking aid device. 5,004,997, Cl. 340-436.000.
Sholder, Jason A.: *See*—
Hafelfinger, Werner; Sholder, Jason A.; King, Murray P.; and Duncan, James L., 5,003,975, Cl. 128-419.0PG.
Shop-Vac Corporation: *See*—
Berfield, Robert C., 5,004,160, Cl. 239-525.000.
Shopsmith, Inc.: *See*—
Legler, John G.; Folkerth, Harold E.; Flora, David D.; and Hile, Barry L., 5,004,027, Cl. 144-136.00R.
Shorey, Thomas H.: *See*—
Jensen, Tom M.; and Shorey, Thomas H., 5,004,387, Cl. 410-69.000.
Shriver, Frank L., to Adolph Coors Company. Fountain roll and assembly for can decorating apparatus. 5,003,875, Cl. 101-350.000.
Shu, Timour T.: *See*—
Hinzmann, Alfred; Shu, Timour T.; Drewnowski, Wojciech S.; and Preisner, Peter M., 5,004,467, Cl. 604-904.000.
Shuyama, Hideo: *See*—
Takahashi, Mitsuru; Shuyama, Hideo; Miyano, Osamu; and Tsutsumi, Yukihiro, 5,004,567, Cl. 260-408.000.
Sickler, Janet: *See*—
Mace, Everitt W.; Sickler, Janet; and Srinivasan, Varadarajan, 5,004,508, Cl. 148-22.000.
Sideman, Samuel: *See*—
Grunfeld, Hay; Lotan, Noah; and Sideman, Samuel, 5,004,547, Cl. 210-635.000.
Siegel, Robert S.: *See*—
Craig, William S.; and Siegel, Robert S., 5,004,688, Cl. 435-69.300.
Siegemund, Gunter: *See*—
Rohrscheid, Freimund; Siegemund, Gunter; and Lau, Jurgen, 5,004,797, Cl. 528-206.000.
Siemens Aktiengesellschaft: *See*—
Capdebosco, Bernard, 5,003,854, Cl. 83-331.000.
de Oliveira, Antonio M. d. A.; and Staerk, Jakob, 5,004,937, Cl. 307-443.000.
Grage, Ludger; and Dato, Paul, 5,005,083, Cl. 358-181.000.
Prasse, Karl-Heinz, 5,004,907, Cl. 250-214.0AG.
Stegherr, Michael, 5,004,939, Cl. 307-475.000.
Siemens Energy & Automation, Inc.: *See*—
Moody, G. Lawrence; Leone, David A.; and Bell, Mark E., 5,004,875, Cl. 200-400.000.
Siemens-Pacesetter, Inc.: *See*—
Hafelfinger, Werner; Sholder, Jason A.; King, Murray P.; and Duncan, James L., 5,003,975, Cl. 128-419.0PG.
Sikora, Gary J., to Westinghouse Electric Corp. Multiple pulse delay processor. 5,005,017, Cl. 342-172.000.

Sili-Tex, Inc.: *See*—
Caldwell, J. Michael, 5,004,643, Cl. 428-246.000.
Silver, David R. Method and apparatus for preventing and treating anaerobic infections. 5,003,993, Cl. 128-842.000.
Silverberg, Howard Z.: *See*—
Fonss, Jack G.; Silverberg, Howard Z.; and Gardiner, Martin H., 5,004,962, Cl. 318-85.000.
Simmons, George H. Break-away coupling. 5,004,366, Cl. 403-2.000.
Simoens, Anthony; and Hannecart, Etienne, to Solvay & Cie (Societe Anonyme). Compositions based on vinylidene fluoride polymers, which have a reduced smoke-producing capacity. 5,004,773, Cl. 524-178.000.
Simon, Ira J.: *See*—
Campbell, Andrew B.; and Simon, Ira J., 5,004,277, Cl. 292-166.000.
Simonovits, Emilia: *See*—
Jekkel nee Bokany, Antonia; Albrecht, Karoly; Ambrus, Gabor; Lang, Tibor; Szabo, Istvan M.; Ilkoy, Eva; Konczol, Kalman; Moravcsik, Imre; Hantos, Gabor; Simonovits, Emilia; Lengyel nee Szemenyei, Zsuzsanna; Vida, Zsuzesanna; and Csajagi, Eva, 5,004,695, Cl. 435-253.100.
Simpson, Jay R.: *See*—
Desurvire, Emmanuel; Giles, Clinton R.; Simpson, Jay R.; and Zyskind, John L., 5,005,175, Cl. 372-6.000.
Simpson, Princess E.: *See*—
Feldman, Martin; and Simpson, Princess E., 5,004,321, Cl. 350-320.000.
Simpson, Richard D., to Texas Instruments Incorporated. Clock pulse generating circuits. 5,005,193, Cl. 377-33.000.
Simpson, William J.; and Hammond, John R. M., to Lumac BV. Method for ATP extraction. 5,004,684, Cl. 435-8.000.
Sinclair, Colin S.: *See*—
Tallentire, Alan; and Sinclair, Colin S., 5,004,645, Cl. 428-323.000.
Singor, Aydin, to Leopold Kostal GmbH & Co. KG. Sealing arrangement for an electrical cable. 5,004,868, Cl. 174-76.000.
Sisoler, Paul G.: *See*—
Weglarz, Michael W.; Vincent, Michael T.; Prestel, James F.; and Sisoler, Paul G., 5,003,952, Cl. 123-478.000.
Weglarz, Michael W.; Vincent, Michael T.; Prestel, James F.; and Sisoler, Paul G., 5,003,953, Cl. 123-478.000.
Siverns, Steven L.: *See*—
Crawford, Paul M.; Campbell, Herbert W.; Myers, Michael J.; and Siverns, Steven L., 5,003,814, Cl. 73-59.000.
Sizonenko, Olga N.; Maxutov, Rafkhat A.; Maljushevsky, Pavel P.; Gorovenko, Georgy G.; Sokolov, Alexei V.; Lyapis, Diana N.; Schekin, Vladimir I.; and Kuskova, Natalya I. Method for well stimulation in the process of oil production and device for carrying same into effect. 5,004,050, Cl. 166-248.000.
Skanska Slakterimasiner: *See*—
Moritz, Kjell, 5,003,665, Cl. 452-185.000.
Skelton, John: *See*—
Fronk, David M.; Brookstein, David S.; and Skelton, John, 5,004,474, Cl. 623-13.000.
SKF Industrial Trading and Development Co. B.V.: *See*—
Jacobson, Bo O., 5,004,359, Cl. 384-526.000.
Skilliter, William J.: *See*—
Borer, John W.; Skilliter, William J.; and Conner, Lowell J., 5,004,492, Cl. 65-289.000.
Skinner, Kenneth R., to North American Philips Corporation. Remote control television system using supplementary unit for simplified personalized control. 5,005,084, Cl. 358-194.100.
Sklan, David: *See*—
Chalupa, William; Kronfeld, David S.; Schneider, Paul L.; and Sklan, David, 5,004,728, Cl. 514-12.000.
Skorupski, Jeffrey H.: *See*—
Breen, Michael T.; and Skorupski, Jeffrey H., 5,005,130, Cl. 364-426.010.
Skuballa, Werner: *See*—
Raduechel, Bernd; Skuballa, Werner; Vorbrueggen, Helmut; Loge, Olaf; and Schilliner, Ekkehard, 5,004,752, Cl. 514-530.000.
Smirnov, Gennady A.: *See*—
Goikhman, Yakov A.; Krjukov, Georgy M.; Onotsky, Melis I.; Sorokin, Georgy M.; Filatov, Alexei V.; Tsarapkin, Viktor V.; Yakimov, Vadim P.; Smirnov, Gennady A.; Nikiforov, Ivan I.; Burdukovsky, Alexandr I.; Daibov, Sergei V.; and Kurdjukov, Alexandr S., 5,004,056, Cl. 175-293.000.
Smith, Barbara A.: *See*—
Lee, Richard J.; Smith, Barbara A.; Theys, Robert G.; Theys, Robert A.; and Murphy, Judy A., 5,004,920, Cl. 250-304.000.
Smith, Christopher: *See*—
Ashton, Michael J.; Bridge, Andrew W.; Chambers, Robert K.; Dron, Donald I.; Fenton, Garry; Harris, Neil V.; Lythgoe, David J.; McFarlane, Ian M.; Newton, Christopher G.; Riddell, David; Smith, Christopher; Stuttle, Keith A. J.; and Toft, Malcolm P., 5,004,747, Cl. 514-309.000.
Smith, David J.: *See*—
Kleven, Lawrence P.; Agranat, Edward A.; Crisafulli, Jerry; Robinson, Hugh; Smith, David J.; Wiseley, Thomas; Fortier, Richard C.; Johnson, Severne; and Menzin, Marvin, 5,004,954, Cl. 315-106.000.
Smith, Donald E. Golf club and bag security device. 5,004,100, Cl. 206-315.200.
Smith, Earl B.: *See*—
Hirschmann, Robert P.; Beard, William Q., Jr.; Mainz, Eric L.; Smith, Earl B.; and Little, Barry M., 5,004,849, Cl. 570-224.000.
Smith, Irl W.: *See*—
Dorschner, Terry A.; and Smith, Irl W., 5,004,343, Cl. 356-350.000.
Smith, J. Lamar: *See*—
Serrell, Robert; Smith, J. Lamar; and Kurst, Frederick L., 5,004,896, Cl. 235-437.000.
Smith, John R.: *See*—
Lipchak, John B.; Oblak, Tod A.; Bednar, Fred H.; Ciaramitaro, William; Hughes, Francis R.; Smith, John R.; and Gisoni, Gregory A., 5,005,142, Cl. 364-550.000.
Smither, Robert K., to United States of America, Energy. Crystal diffraction lens with variable focal length. 5,004,319, Cl. 350-162.210.
SmithKline Beecham Corporation: *See*—
Boehm, Jeffrey C.; Hecht, Sidney M.; Holden, Kenneth G.; Johnson, Randall K.; and Kingsbury, William D., 5,004,758, Cl. 514-283.000.
Smolarek, James: *See*—
Haas, Oscar W.; Prasad, Ravi; and Smolarek, James, 5,004,482, Cl. 55-16.000.
Smyly, George M., Sr. Trailered boat cradle. 5,004,260, Cl. 280-414.100.
Snap-on Tools Corporation: *See*—
Becker, Thomas P.; Rameshk, Sohrab S.; and Crass, Matthew M., 5,004,984, Cl. 324-402.000.
Snipes, Wallace C., to Zetachron, Inc. Low-melting moldable pharmaceutical excipient and dosage forms prepared therewith. 5,004,601, Cl. 424-78.000.
Snyder, George W.: *See*—
Mixon, Larry C.; Snyder, George W.; Hill, Scott D.; Johnson, Gregory L.; Wlodarski, J. Frank; von Spakovsky, Alexis P.; Emerson, John D.; Cole, James M.; and Tipton, John P., 5,003,883, Cl. 102-476.000.
Societe Anonyme Dite: L'Oreal: *See*—
Philippe, Michel; and Sebag, Henri, 5,004,729, Cl. 514-29.000.
Philippe, Michel; and Sebag, Henri, 5,004,731, Cl. 514-29.000.
Philippe, Michel; and Sebag, Henri, 5,004,732, Cl. 514-29.000.
Philippe, Michel; and Sebag, Henri, 5,004,733, Cl. 514-029.000.
Philippe, Michel; and Sebag, Henri, 5,004,734, Cl. 514-29.000.
Societe Anonyme Dite: Millet: *See*—
Dufournet, Francois; and Vernerey, Philippe, 5,004,135, Cl. 224-210.000.
Societe Chimiques des Charbonnages S.A.: *See*—
Boinot, Francois; Cousin, Michel; Francois, Pierre-Michel; and Michel-Dansac, Francois, 5,004,789, Cl. 525-506.000.
Societe de Construction des Avions Hurel-Bubois: *See*—
Schegerin, Robert; Laboure, Bernard; and Standish, Robert, 5,003,770, Cl. 60-226.200.
Societe Nationale Elf Aquitaine (Production): *See*—
Maurice, Jacques; Fouque, Romain; and Auriol, Jean-Louis, 5,004,591, Cl. 423-578.00R.
Societe Nationale Industrielle et Aerospatiale: *See*—
Aubry, Jacques A.; and Mondet, Jean J., 5,004,215, Cl. 267-140.100.
Sodec, Franc; Hudson, Donald L.; and Bolen, David T., to Hudson Associates, Inc. Air conditioning system for grocery store or the like and diffuser units thereof. 5,003,867, Cl. 98-31.600.
Soderberg, Per O., to Astra Meditec Aktiebolag. Dental bridge and manner for preparation. 5,004,420, Cl. 433-172.000.
Soffiatti, Renzo: *See*—
Faccioli, Giovanni; De Bastiani, Basilio M.; Magnan, Bruno; and Soffiatti, Renzo, 5,004,501, Cl. 106-35.000.
Sogge, Dale R.; O'Brien, Edward F.; and Czarn, David A., to Texas Instruments Incorporated. Pressure responsive switch particularly adaptable for operation as a normally open or a normally closed switch. 5,004,876, Cl. 200-83.00P.
Sokolov, Alexei V.: *See*—
Sizonenko, Olga N.; Maxutov, Rafkhat A.; Maljushevsky, Pavel P.; Gorovenko, Georgy G.; Sokolov, Alexei V.; Lyapis, Diana N.; Schekin, Vladimir I.; and Kuskova, Natalya I., 5,004,050, Cl. 166-248.000.
Solon Technologies, Inc.: *See*—
Moscovitch, Marko, 5,004,921, Cl. 250-337.000.
Solvay & Cie (Societe Anonyme): *See*—
Simoens, Anthony; and Hannecart, Etienne, 5,004,773, Cl. 524-178.000.
Somers, James S., to Concord Industries, Inc. Apparatus for blocking a winch. 5,004,177, Cl. 242-99.000.
Sommi, Franco; and Arelli, Pier L., to Manzini, S.p.A. Method of processing a food product having a liquid content. 5,004,621, Cl. 426-386.000.
Sonnenberg, Wade: *See*—
Bernards, Roger F.; Fisher, Gordon; and Sonnenberg, Wade, 5,004,525, Cl. 204-52.100.
Sonoda, Mitsuo: *See*—
Kanai, Takashi; Ochiai, Masami; Oshina, Morio; and Sonoda, Mitsuo, 5,003,776, Cl. 60-434.000.
Sony Corporation: *See*—
Asano, Mitsuyasu, 5,005,081, Cl. 358-167.000.
Gillard, Clive H., 5,005,078, Cl. 358-140.000.
Iwamoto, Koji; Hamada, Kenichi; and Hirota, Katsuaki, 5,005,086, Cl. 358-227.000.
Kanada, Tokio, 5,005,098, Cl. 360-130.340.
Mitsumori, Koji; and Kume, Hidehiro, 5,005,162, Cl. 369-44.120.
Samad, Raphael; and Gillard, Clive H., 5,005,077, Cl. 358-140.000.
Sorbello, Robert M.: *See*—
Zaghloul, Amir I.; and Sorbello, Robert M., 5,005,019, Cl. 343-700.0MS.
Sorbo, Peter: *See*—
D'Amato, Salvatore F.; Sorbo, Peter; and Dunning, Richard E., 5,003,915, Cl. 118-46.000.

Soref, Richard A., to United States of America, Air Force. Low loss semiconductor directional coupler switches including gain method of switching light using same. 5,004,447, Cl. 350-96.140.
Sorensen, Thomas V., to Gunlocke Co., The. Office partition, panel-to-panel quick-locking mechanism. 5,004,371, Cl. 403-327.000.
Sorokin, Georgy M.: *See*—
Goikhman, Yakov A.; Krjukov, Georgy M.; Onotsky, Melis I.; Sorokin, Georgy M.; Filatov, Alexei V.; Tsarapkin, Viktor V.; Yakimov, Vadim P.; Smirnov, Gennady A.; Nikiforov, Ivan I.; Burdukovsky, Alexandr I.; Daibov, Sergei V.; and Kurdjukov, Alexandr S., 5,004,056, Cl. 175-293.000.
Southwest Electric Company: *See*—
Owen, Donald W., 5,005,100, Cl. 361-35.000.
Sova, Phillip R., to Technological Safety Design, Inc. Apparatus and method for automatic operation of a bilge blower. 5,003,906, Cl. 114-211.000.
Spade leasing, Inc.: *See*—
Pelt, J. Eugene, 5,004,269, Cl. 280-837.000.
Specialized Shipping Products, Ltd.: *See*—
Mallard, Bobby J.; Knapp, Richard H.; Roper, W. J.; and Harrison, Daniel R., 5,004,071, Cl. 182-3.000.
Specified Equipment Systems Company, Inc.: *See*—
Kistner, Kenneth J., 5,004,159, Cl. 239-337.000.
Speck, Ulrich: *See*—
Blaszkiewicz, Peter; and Speck, Ulrich, 5,004,835, Cl. 564-153.000.
Spector, George: *See*—
Terbrusch, Rosemarie; and Spector, George, 5,004,114, Cl. 220-296.000.
Whitlock, Arthur D.; and Spector, George, 5,003,719, Cl. 43-17.500.
Spectrum Sciences B.V.: *See*—
Landa, Benzion; Hochman, Haim; and Yacoub, Naseem, 5,004,165, Cl. 241-21.000.
Spehar, Eli G. Utility knife with opposing blades. 5,003,696, Cl. 30-299.000.
Spencer, R. Wilson. Sample extraction system. 5,003,830, Cl. 73-863.830.
Spies, Hans; Woehrl, Alfons; and Spies, Martin, to Messerschmitt-Boelkow-Blohm GmbH. Controllable semiconductor image sensor and arrangement with such a sensor. 5,005,085, Cl. 358-213.110.
Spies, Martin: *See*—
Spies, Hans; Woehrl, Alfons; and Spies, Martin, 5,005,085, Cl. 358-213.110.
Spinger, J. William; and Schlett, Eugene, to Industrial Nut Corp. Externally threaded self-locking nut. 5,004,389, Cl. 411-304.000.
Spirk, John W., Jr.: *See*—
Nottingham, John R.; Spirk, John W., Jr.; and Brokaw, Paul E., 5,004,882, Cl. 219-10.55E.
Sports-Mitt International: *See*—
Hoffman, Ned, 5,004,227, Cl. 272-119.000.
Springer, Edward L.; and Minor, James L., to United States of America, Agriculture. Delignification of lignocellulosic materials with monoperoxysulfuric acid. 5,004,523, Cl. 162-76.000.
Square D Company: *See*—
Yin, Simon, 5,004,877, Cl. 200-144.00B.
SRI International: *See*—
Peppers, Norman A., 5,004,311, Cl. 350-6.900.
Winters, Mark A., 5,004,699, Cl. 435-7.310.
Srinivasan, Varadarajan: *See*—
Mace, Everitt W.; Sickler, Janet; and Srinivasan, Varadarajan, 5,004,508, Cl. 148-22.000.
SSMC Inc.: *See*—
Sato, Shuichi; and Kobayashi, Yoshiharu, 5,003,901, Cl. 112-316.000.
Stack, Thomas J.: *See*—
Korczynski, Jacek M.; and Stack, Thomas J., 5,004,994, Cl. 337-66.000.
Staerk, Jakob: *See*—
de Oliveira, Antonio M. d. A.; and Staerk, Jakob, 5,004,937, Cl. 307-443.000.
Stall, Alan D.; and Raudys, Vytas A., to Viskase Corporation. Method and apparatus for making stuffed casing products having one flat end. 5,003,666, Cl. 452-21.000.
Stallard, William A.: *See*—
Booth, Richard C.; Beaumont, Alan R.; Daymond-John, Barbara E.; Cunningham, David G.; and Stallard, William A., 5,004,314, Cl. 350-96.140.
Stamicarbon B.V.: *See*—
Baur, Henricus A. C.; and Kragten, Ubaldus F., 5,004,837, Cl. 568-342.000.
Waagen, Geert N.; Bastiaansen, Cornelis W. M.; and Kirschbaum, Robert, 5,004,778, Cl. 524-474.000.
Stamp, Roger A.; and Williams, Farrell D., to Hydro Air Industries, Inc. Hydrotherapy apparatus. 5,003,646, Cl. 4-542.000.
Standard Oil Company, The: *See*—
Percec, Elena S.; and Takigawa, Doreen Y., 5,004,783, Cl. 525-77.000.
Standish, Robert: *See*—
Schegerin, Robert; Laboure, Bernard; and Standish, Robert, 5,003,770, Cl. 60-226.200.
Standlick, Ronald E., to Jesco Products Company, Inc. Multiple component flow gun. 5,004,125, Cl. 222-145.000.
Staniforth, John N., to Forum Chemicals Ltd. Controlled release device with an impermeable coating having an orifice for release of drug. 5,004,614, Cl. 424-466.000.
Stanley Works, The: *See*—
Hanley, Roger T., 5,004,276, Cl. 292-126.000.
Star-kist Foods, Inc.: *See*—
Koschak, Francis L.; and Sarno, Felicisimo S., 5,004,624, Cl. 426-623.000.
Stark, Charles, to Bobst SA. Device for conveying plate-like matter within a rotary printing machine. 5,004,221, Cl. 271-194.000.
Staub, Richard A.: *See*—
Wyatt, Richard J.; Freed, William J.; and Staub, Richard A., 5,004,457, Cl. 604-158.000.
Staudinger, Joseph: *See*—
Golio, John M.; and Staudinger, Joseph, 5,005,059, Cl. 357-22.000.
Staunton, Harold F.: *See*—
Hallam, Donald E.; Popper, Peter; Staunton, Harold F.; Taylor, Robert E.; and Yngve, Paul W., 5,003,763, Cl. 57-297.000.
Stavinoha, Jerome L.: *See*—
Devon, Thomas J.; Phillips, Gerald W.; Puckette, Thomas A.; Stavinoha, Jerome L.; and Vanderbilt, Jeffrey J., 5,004,823, Cl. 556-136.000.
Stefaniak, Philip S.; and Fine, Daniel H., to Columbia in the City of New York, The Trustees of. Method and apparatus for dispensing a fluid substance. 5,004,124, Cl. 222-136.000.
Stefanovski, Miles: *See*—
Edelman, William; Constantinou, Dennis; Stefanovski, Miles; Jan, Yuh L.; Fahlen, Theodore S.; Hansen, Ronald L.; and Kramasz, Kenneth J., 5,005,180, Cl. 372-57.000.
Stegherr, Michael, to Siemens Aktiengesellschaft. CMOS-ECL converter. 5,004,939, Cl. 307-475.000.
Steiner, Norm. Painted display assembly. 5,003,715, Cl. 40-442.000.
Stendel, Wilhelm: *See*—
Weissmuller, Joachim; Tietjen, Klaus-Gunther; Stendel, Wilhelm; and Wachendorff-Neumann, Ulrike, 5,004,744, Cl. 514-247.000.
Stettner, Ernest R.; and Stoltman, Donald D., to General Motors Corporation. Solenoid actuated valve assembly. 5,004,162, Cl. 239-585.000.
Steuck, Michael J.: *See*—
Pluskal, Malcolm G.; Wang, David; and Steuck, Michael J., 5,004,543, Cl. 210-490.000.
Stewart, Christopher O.; and Suprise-Mansfield, Karen. Manicuring aid for infants. 5,003,997, Cl. 132-73.000.
Stich, Richard A.: *See*—
Stocking, George E.; Stich, Richard A.; Besore, John K.; and Denham, Clarence W., 5,004,302, Cl. 312-214.000.
Stig G. Carlqvist Motor Consultant, (C.M.C.) Aktiebolag: *See*—
Carlqvist, Stig G., 5,003,832, Cl. 74-51.000.
Stillie, Donald G.: *See*—
Aiello, Richard E.; Stillie, Donald G.; and Allgood, Christopher L., 5,004,434, Cl. 439-636.000.
Stinar, Robert P.; Calvas, George T.; and McNamara, David A., to Ford Motor Company. Programmable key and improved lock assembly. 5,003,801, Cl. 70-278.000.
Stinard, Philip S.: *See*—
Robertson, Donald S.; and Stinard, Philip S., 5,004,864, Cl. 800-235.000.
Stipkovits, Frank M. Gap bridging assembly for use with vertical blind assemblies. 5,004,033, Cl. 160-178.100.
Stirling, Thomas E.; and Ackerman, John R., to Barrett, Haentjens & Co. Air stripping of liquids using high intensity turbulent mixer. 5,004,484, Cl. 55-53.000.
Stirling, William. Agricultural bale sheathing apparatus and method. 5,003,754, Cl. 53-459.000.
Stocker, Erwin E.: *See*—
Bemis, Steve; and Stocker, Erwin E., 5,004,513, Cl. 156-191.000.
Stocking, George E.; Stich, Richard A.; Besore, John K.; and Denham, Clarence W., to General Electric Company. Shelf support system for split cantilever shelves. 5,004,302, Cl. 312-214.000.
Stokes, Ronald E.; Nowak, William J.; Attardi, Anthony A.; and Costanza, Daniel W., to Xerox Corporation. Frequency sweeping excitation of high frequency vibratory energy producing devices for electrophotographic imaging. 5,005,054, Cl. 355-273.000.
Stolka, Milan: *See*—
Badesha, Santokh S.; Stolka, Milan; Pai, Damodar M.; and Abkowitz, Martin A., 5,004,663, Cl. 430-59.000.
Stoltman, Donald D.: *See*—
Stettner, Ernest R.; and Stoltman, Donald D., 5,004,162, Cl. 239-585.000.
Stone, James R.: *See*—
Langford, Stephen R.; Stone, James R.; and Bagley, William C., 5,004,058, Cl. 177-25.130.
Stone, Thomas R.: *See*—
Thanos, William N.; Peterson, Bruce R.; Moon, William G.; Lindsay, Joshua; and Stone, Thomas R., 5,005,089, Cl. 360-77.080.
Stoner, Beverly A.: *See*—
Koblitz, Francis F.; O'Shea, Thomas M.; Stoner, Beverly A.; and Yula, Joseph J., 5,004,869, Cl. 174-84.00C.
Stoody, William R. Fluid dispenser with non-venting aspirator and bag. 5,004,123, Cl. 222-94.000.
Stopforth, Douglas R., to Manesty Machines Limited. Tablet making machines. 5,004,413, Cl. 425-182.000.
Storage Technology Corporation: *See*—
Lunka, Harold A.; and Marlowe, Christian P., 5,004,393, Cl. 414-331.000.
Storbeck, Timothy A.: *See*—
Dunn, Wendell E., Jr.; Carda, Dan D.; and Storbeck, Timothy A., 5,004,500, Cl. 75-422.000.

Storm, Greg J.: *See*—
Storm, Manfred; and Storm, Greg J., 5,004,139, Cl. 224-324.000.
Storm, Manfred; and Storm, Greg J., to Hagus, U.S.A., Inc. Vehicle article holder. 5,004,139, Cl. 224-324.000.
Storni, Angelo, to Ciba-Geigy Corporation. Pharmaceutical use of laevorotatory basic derivative of 9,10-ethanoanthracene. 5,004,755, Cl. 514-653.000.
Stovring, Knud S., to Helioprint Als. Reprographic camera system. 5,005,045, Cl. 355-68.000.
Straight, Jay G.; and Moore, Henry P., to Eskimo Pie Corporation. Method and apparatus for enrobing confections. 5,004,620, Cl. 426-304.000.
Straight, Michael R.: *See*—
Roinestad, Gerald C.; and Straight, Michael R., 5,004,097, Cl. 198-803.010.
Stranford, Gerald T.; Gonczy, Stephen T.; and Mitsche, Roy T., to Allied-Signal Inc. High surface area silicon nitride and use thereof. 5,004,709, Cl. 501-97.000.
Strassler, Sigfrid: *See*—
Ryser, Peter; and Strassler, Sigfrid, 5,005,003, Cl. 340-587.000.
Strausbaugh, Dennis I.; and Strausbaugh, Irvin R. Plug or cap puller. 5,003,682, Cl. 29-259.000.
Strausbaugh, Irvin R.: *See*—
Strausbaugh, Dennis I.; and Strausbaugh, Irvin R., 5,003,682, Cl. 29-259.000.
Streck Laboratories, Inc.: *See*—
Ryan, Wayne L., 5,004,355, Cl. 374-194.000.
Strehler, Richard: *See*—
Pflaum, Hermann; and Strehler, Richard, 5,003,817, Cl. 73-118.100.
Stresswave Technology Limited: *See*—
Holroyd, Trevor J.; and Tracey, Timothy E., 5,004,985, Cl. 324-727.000.
Strobl, Frederick P., Jr.; and Glatt, Jack E. Structure and components for enclosing sun spaces and the like and method for erecting same. 5,003,733, Cl. 52-86.000.
Stromire, Mark L. Method and apparatus for armament control. 5,003,862, Cl. 89-133.000.
Stroppina, Mario; and Ronchetti, Luigi, to RAI Radiotelevisione Italiana S.p.A. DCT video signal compression device with intrafield-/interfield switching and adjustable high frequency filter. 5,005,076, Cl. 358-135.000.
Structural Block Systems, Inc.: *See*—
Wilston, Arthur, 5,003,746, Cl. 52-589.000.
Stude, Rolf-Rudiger; and Wilken-Trenkamp, Ludger, to Kreyenborg Verwaltungen und Beteiligungen KG. Apparatus for filtering plasticized materials in extruders and like machines. 5,004,414, Cl. 425-185.000.
Stumpf, William E.; Carlson, Casey L.; Knape, Richard S.; and Bessinger, Walter L., to Knape & Vogt Manufacturing Company. Book end bracket and shelving system. 5,004,202, Cl. 248-243.000.
Stuttle, Keith A. J.: *See*—
Ashton, Michael J.; Bridge, Andrew W.; Chambers, Robert K.; Dron, Donald I.; Fenton, Garry; Harris, Neil V.; Lythgoe, David J.; McFarlane, Ian M.; Newton, Christopher G.; Riddell, David; Smith, Christopher; Stuttle, Keith A. J.; and Toft, Malcolm P., 5,004,747, Cl. 514-309.000.
Su, Michael. Electronic eyeball of doll. 5,004,443, Cl. 446-392.000.
Su, Shihuai: *See*—
Yu, Meng W.; Su, Shihuai; Chen, Yue Z.; Zheng, Ticheng; Ji, Kebin; Ling, Shou R.; Lin, Jian C.; Deng, Jianhui; and Zhang, Kunwu, 5,004,510, Cl. 148-146.000.
Sublette, Kerry L., to ABB Environmental Services Inc. Catalytic oxidation of hazardous wastes. 5,004,551, Cl. 210-763.000.
Suda, Yasuo; Ohtaka, Keiji; Suzuki, Kenji; Ishizaki, Akira; and Aoyama, Keisuke, to Canon Kabushiki Kaisha. Focus detecting apparatus having a plurality of focus detecting areas. 5,005,041, Cl. 354-407.000.
Sudmanns, Hans: *See*—
Gubon, Peter; Sudmanns, Hans; and Teetz, Christoph, 5,003,934, Cl. 123-52.0MV.
Suenaga, Takashi: *See*—
Aramaki, Minoru; Suenaga, Takashi; Sakaguchi, Hiroaki; and Hamana, Takanori, 5,004,829, Cl. 562-113.000.
Suga, Tamio. Surface unit on peripheral wall of tennis court field. 5,004,235, Cl. 273-29.00A.
Sugavanam, Balasubramanyan; Worthington, Paul A.; and Clough, John M., to Imperial Chemical Industries PLC. Heterocyclic compounds. 5,004,494, Cl. 71-92.000.
Sugawara, Minoru: *See*—
Kobayashi, Masato; Yamaguchi, Yoh-Ichi; Sugawara, Minoru; and Yamashiro, Kazuhide, 5,005,075, Cl. 378-35.000.
Sugita, Masanori: *See*—
Ogawa, Osamu; Kishi, Ikuo; Tahara, Yoshiyuki; and Sugita, Masanori, 5,004,756, Cl. 514-655.000.
Sugiura, Takashi: *See*—
Matsuyama, Kazuo; Sugiura, Takashi; and Komai, Takeshi, 5,004,780, Cl. 525-27.000.
Suk, Eugene J., to American Electric FL Industries, Inc., Division. Bracket. 5,004,199, Cl. 248-231.800.
Sullivan, Harold W.; and McConnell, Pat M., to Texas Instruments Incorporated. Robot slice aligning end effector. 5,004,399, Cl. 414-729.000.
Sullivan, John F., to Scheurer, Robert S. Rotary weed extractor. 5,004,283, Cl. 294-61.000.
Sumitomo Chemical Company, Ltd.: *See*—
Mashita, Kentaro; Fujii, Takeshi; and Oomae, Tadayuki, 5,004,782, Cl. 525-64.000.
Mori, Tatsuya; Ohsumi, Tadashi; Nakamura, Shigeo; Maeda, Kiyoto; Nishida, Sumio; and Takano, Hirotaka, 5,004,816, Cl. 549-462.000.
Otaka, Ken; Matsuo, Noritada; Tsushima, Kazunori; and Yano, Toshihiko, 5,004,753, Cl. 514-531.000.
Sato, Hiroshi; Hirose, Kenichi; Nagai, Koichi; Yoshioka, Hiroshi; and Nagaoka, Yoshihiko, 5,004,846, Cl. 568-940.000.
Tamura, Mitsuhisa; Suzukamo, Gohu; and Hirose, Ken-ichi, 5,004,843, Cl. 568-670.000.
Sumitomo Electric Industries, Ltd.: *See*—
Yamada, Shinji; Kohno, Teruhisa; and Takata, Koji, 5,004,301, Cl. 303-115.000.
Yoshino, Masato, 5,005,132, Cl. 364-426.020.
Sumitomo Metal Industries, Ltd.: *See*—
Nakasuji, Kazuyuki; and Hayashi, Chihiro, 5,004,143, Cl. 228-126.000.
Sumitomo Rubber Industries, Ltd.: *See*—
Iwanaga, Takeshi; and Ohnishi, Akio, 5,004,242, Cl. 273-169.000.
Sumitomo Wiring System, Ltd.: *See*—
Iura, Kazuo; Tsuji, Kazunori; and Saka, Kazuhito, 5,003,761, Cl. 57-58.520.
Sumitsu & Company, Limited: *See*—
Fujimura, Yasuo; and Fujiwara, Toshio, 5,003,856, Cl. 83-576.000.
Summagraphics Corporation: *See*—
Lasley, Daniel G., 5,004,872, Cl. 178-18.000.
Purcell, Alexander M., 5,004,871, Cl. 178-18.000.
Sunagawa, Masao; Kubota, Kazuhiro; Ishii, Yoshitaro; and Satoh, Susumu, to Hitachi, Ltd. Upright-type electric vacuum cleaner. 5,003,663, Cl. 15-366.000.
Sundstrand Corporation: *See*—
Grimm, Duane H., 5,004,073, Cl. 184-6.120.
Huber, Jeffrey A., 5,003,772, Cl. 60-259.000.
Hutchison, Richard M., 5,004,407, Cl. 418-1.000.
Jewess, Gordon, 5,004,074, Cl. 184-105.100.
Mehr-Ayin, Kourosh; and Schuh, Paul A., 5,004,084, Cl. 192-0.033.
Rice, Richard W., 5,003,823, Cl. 73-293.000.
Rodgers, Colin, 5,003,767, Cl. 60-39.142.
Sunkara, Sai P.: *See*—
Liu, Paul S.; Sunkara, Sai P.; and Bowlin, Terry L., 5,004,746, Cl. 514-299.000.
Sunpower, Inc.: *See*—
Berchowitz, David M., 5,003,777, Cl. 60-520.000.
Superior Surgical Manufacturing Co. Inc.: *See*—
Benstock, Gerald M.; Belkin, Nathan L.; and Green, Robert, 5,003,902, Cl. 112-418.000.
Supertruss Pty. Ltd.: *See*—
Carr, Noel R., 5,003,748, Cl. 52-693.000.
Suprise-Mansfield, Karen: *See*—
Stewart, Christopher O.; and Suprise-Mansfield, Karen, 5,003,997, Cl. 132-73.000.
Suto, Yoshinori: *See*—
Kakinoki, Yoshikazu; Nakashima, Masato; Koezuka, Tetsuo; Hiraoka, Noriyuki; Tsukahara, Hiroyuki; Suto, Yoshinori; Oshima, Yoshitaka; and Hashinami, Shinji, 5,004,929, Cl. 250-561.000.
Suyefuji, Mineo: *See*—
Terai, Fumitaka; Yukawa, Kimio; Suyefuji, Mineo; Saito, Hiroki; and Yamaguchi, Shigeru, 5,004,628, Cl. 427-389.900.
Suzukamo, Gohu: *See*—
Tamura, Mitsuhisa; Suzukamo, Gohu; and Hirose, Ken-ichi, 5,004,843, Cl. 568-670.000.
Suzuki, Akio; Takada, Yoshihiro; Izumizaki, Masami; and Danzuka, Toshimitsu, to Canon Kabushiki Kaisha. Printing method in which both sides of the recording sheet are inspected and apparatus therefor. 5,004,928, Cl. 250-559.000.
Suzuki, Akira, to Aisin AW Kabushiki Kaisha. Pressure control valve. 5,004,440, Cl. 137-625.650.
Suzuki, Atsushi, to Cleanlite Aire Inc. Deodorizing agent. 5,004,600, Cl. 424-76.300.
Suzuki, Hitoshi: *See*—
Kugimiya, Shuzo; Fukumochi, Yoji; Nakamura, Ichiko; Hirai, Tokuyuki; and Suzuki, Hitoshi, 5,005,127, Cl. 364-419.000.
Suzuki, Kazuhiro: *See*—
Yamazaki, Etsuo; Iehisa, Nobuaki; and Suzuki, Kazuhiro, 5,004,889, Cl. 219-121.610.
Suzuki, Kenji: *See*—
Suda, Yasuo; Ohtaka, Keiji; Suzuki, Kenji; Ishizaki, Akira; and Aoyama, Keisuke, 5,005,041, Cl. 354-407.000.
Suzuki, Masahiko: *See*—
Kuroyanagi, Masatoshi; Suzuki, Masahiko; Matsui, Kazuma; Imaeda, Makoto; Nagai, Kouzi; and Ito, Yoshiaki, 5,004,406, Cl. 417-273.000.
Suzuki, Masayuki; and Hattori, Jun, to Canon Kabushiki Kaisha. Spherical lens and imaging device using the same. 5,004,328, Cl. 350-416.000.
Suzuki, Motoshi: *See*—
Kozaki, Tetsuji; Ishikawa, Hiroshi; Yasui, Hideaki; Shimamoto, Mamoru; Hibino, Katsuhiko; and Suzuki, Motoshi, 5,004,264, Cl. 280-707.000.
Suzuki, Noboru; Toji, Shigeo; and Uenaka, Yukio, to Asahi Kogaku Kabushiki Kaisha. Signal processing device for automatic-focusing video signal in electronically controlled photographic camera. 5,005,087, Cl. 358-227.000.

Suzuki, Susumu; Ishida, Kazuyuki; and Ozaki, Takeo, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Device for analyzing fluorescent light signals. 5,003,977, Cl. 128-633.000.

Suzuki, Syuji; and Nishio, Makoto, to NEC Corporation. Time and wavelength division switching system. 5,005,166, Cl. 370-1.000.

Suzuki, Takashi: *See*—
Kobayashi, Atsushi; Suzuki, Takashi; and Kosugi, Yasuhiko, 5,005,043, Cl. 355-27.000.

Suzuki, Takayuki: *See*—
Ueno, Yoshifusa; Tanzawa, Takihei; and Suzuki, Takayuki, 5,004,988, Cl. 331-116.00R.

Suzuki, Tamotsu: *See*—
Namiki, Tomizo; Suzuki, Tamotsu; and Katayama, Masashi, 5,004,668, Cl. 430-256.000.

Suzuki, Tsuguya: *See*—
Shibata, Katsuhiro; Azuma, Yuichi; and Suzuki, Tsuguya, 5,004,497, Cl. 75-229.000.

Suzuki, Yasutomo: *See*—
Fukushima, Nobuo; Sakai, Shinji; Takdea, Osamu; Takei, Masahiro; Suzuki, Yasutomo; Okino, Tadashi; and Jinnai, Shigeru, 5,005,088, Cl. 360-69.000.

Suzuki, Yoshiyuki: *See*—
Nakao, Shinroku; Suzuki, Yoshiyuki; and Kato, Hitoshi, 5,004,253, Cl. 280-47.380.

Svec, Paul S.; Borom, Marcus P.; Szala, Lawrence E.; Brun, Milivoj K.; Miller, Steven A.; and Mourer, David P., to General Electric Company. Transfer tube. 5,004,629, Cl. 427-204.000.

Svecia Antiqua Limited: *See*—
Rosen, Ake, 5,004,327, Cl. 350-398.000.

Swanson, Carl E. Alignment indicator for machine tools. 5,003,703, Cl. 33-638.000.

Swars, Helmut, to Emitec Gesellschaft fur Emissionstechnologie mbH. Hollow shaft having drive elements with axially varied material properties being secured on the hollow shaft by expansion of the hollow shaft. 5,004,370, Cl. 403-277.000.

Swart, Nicholaas C., to Heuft-Qualiplus B.V. Method and an apparatus for inspecting the edge of a lid. 5,004,347, Cl. 356-394.000.

Swede Space Design AB: *See*—
Segerpalm, Hans; and Eklund, Ante, 5,004,304, Cl. 312-201.000.

Swimming Technology Research, Inc.: *See*—
Havriluk, Rod, 5,005,140, Cl. 364-550.000.

Swingline Inc.: *See*—
Olesen, Paul, 5,004,142, Cl. 227-155.000.

Swoyer, John M.: *See*—
Holleman, Timothy W.; Doan, Phong D.; Brennen, Kenneth R.; and Swoyer, John M., 5,003,992, Cl. 128-785.000.

Symanski, James S., to Globe-Union Inc. Thin bipolar lead-acid battery with individual cell vent. 5,004,655, Cl. 429-82.000.

Systron Donner Corporation: *See*—
Hay, Wayne R., 5,004,963, Cl. 320-13.000.

Szabo, Istvan M.: *See*—
Jekkel nee Bokany, Antonia; Albrecht, Karoly; Ambrus, Gabor; Lang, Tibor; Szabo, Istvan M.; Ilkoy, Eva; Konczol, Kalman; Moravcsik, Imre; Hantos, Gabor; Simonovits, Emilia; Lengyel nee Szemenyei, Zsuzsanna; Vida, Zsuzesanna; and Csajagi, Eva, 5,004,695, Cl. 435-253.100.

Szala, Lawrence E.: *See*—
Svec, Paul S.; Borom, Marcus P.; Szala, Lawrence E.; Brun, Milivoj K.; Miller, Steven A.; and Mourer, David P., 5,004,629, Cl. 427-204.000.

T-Systems Corp.: *See*—
Allport, Davies, 5,003,726, Cl. 47-48.500.

Tacchi, Ernest J., to Aqua Pura Group. Apparatus and method for ozone production. 5,004,587, Cl. 422-186.190.

Tachi-S Co., Ltd.: *See*—
Inoue, Nobuhiro, 5,004,295, Cl. 297-191.000.
Ogasawara, Hiromitsu, 5,004,967, Cl. 318-568.100.

Tada, Kuniyuki; Minomiya, Eiichi; and Watanabe, Masatoshi, to Toray Industries, Inc. Process for conversion of ethylbenzene in C_8 aromatic hydrocarbon mixture. 5,004,855, Cl. 585-489.000.

Tadenuma, Masahiko; Miyagi, Tetsuhiro; and Miyazawa, Tadashi, to Akishima Chemical Industries Co., Ltd. Stabilized chlorine-containing resin composition. 5,004,776, Cl. 524-377.000.

Tadokoro, Michihiro: *See*—
Seya, Masatomo; Tadokoro, Michihiro; and Okada, Kazuo, 5,004,900, Cl. 250-201.500.

Taghikhani, Majid: *See*—
Marino, Joseph A.; Makhija, Surender K.; Taghikhani, Majid; and Puetz, Peter A., 5,004,979, Cl. 324-160.000.

Taguchi, Toshio; and Okita, Hajime, to Mitsubishi Jukogyo Kabushiki Kaisha. Continuous vacuum treatment system. 5,003,706, Cl. 34-92.000.

Tahara, Yoshiyuki: *See*—
Ogawa, Osamu; Kishi, Ikuo; Tahara, Yoshiyuki; and Sugita, Masanori, 5,004,756, Cl. 514-655.000.
Okamoto, Yasushi; Tahara, Yoshiyuki; and Mishima, Yoshio, 5,004,735, Cl. 514-134.000.

Takabatake, Masato: *See*—
Hashimoto, Toru; Takabatake, Masato; Chino, Masashi; and Takahashi, Akira, 5,004,981, Cl. 324-207.220.

Takabayashi, Naoki: *See*—
Koboshi, Shigeharu; Kobayashi, Kazuhiro; Goto, Nobutaka; Kurematsu, Masayuki; and Takabayashi, Naoki, 5,004,522, Cl. 159-47.003.

Takabayashi, Tsunehisa: *See*—
Fukushima, Toru; Takabayashi, Tsunehisa; and Ogai, Mikio, 5,005,179, Cl. 372-46.000.

Takada, Kazuhiko: *See*—
Ishikawa, Jun; and Takada, Kazuhiko, 5,004,207, Cl. 248-632.000.

Takada, Yoshihiro: *See*—
Suzuki, Akio; Takada, Yoshihiro; Izumizaki, Masami; and Danzuka, Toshimitsu, 5,004,928, Cl. 250-559.000.

Takagi, Soya; Mori, Kazuhiko; Kawasaki, Minoru; and Kato, Shinji, to Toyota Jidosha Kabushiki Kaisha. Dispersion strengthened copper-base alloy for overlay. 5,004,581, Cl. 420-487.000.

Takahashi, Akira: *See*—
Hashimoto, Toru; Takabatake, Masato; Chino, Masashi; and Takahashi, Akira, 5,004,981, Cl. 324-207.220.

Takahashi, Hiroaki; Okada, Haruo; Matsumoto, Katsuya; and Umino, Masuo, to Toyo Soda Manufacturing Co., Ltd. Process for measuring stable-type glycated hemoglobin in a sample. 5,004,546, Cl. 210-635.000.

Takahashi, Hiroshi, to Nissan Motor Company, Limited. System and method for automatically controlling a vehicle speed to a desired cruising speed. 5,005,133, Cl. 364-426.040.

Takahashi, Hiroto; Karita, Seiichiro; and Sato, Koichi, to Canon Kabushiki Kaisha. Ink jet recording apparatus which supplies repellent agent to liquid discharge port surface and method thereof. 5,005,024, Cl. 346-1.100.

Takahashi, Kozo: *See*—
Gohda, Eiichi; Tsubouchi, Hirohito; Nakayama, Hiroyuki; Hirono, Shuichi; Takahashi, Kozo; Hashimoto, Shuji; and Daikuhara, Yasushi, 5,004,805, Cl. 530-399.000.

Takahashi, Mitsuru; Shuyama, Hideo; Miyano, Osamu; and Tsutsumi, Yukihiro, to Tosoh Corporation. Process for producing fluorine-containing aliphatic carboxylic acids. 5,004,567, Cl. 260-408.000.

Takahashi, Noriyuki: *See*—
Ogawa, Masahide; Sato, Teiji; Tanaka, Masanori; and Takahashi, Noriyuki, 5,004,716, Cl. 501-141.000.

Takahashi, Osamu: *See*—
Yoneyama, Hiroyuki; Takahashi, Osamu; Yoshida, Kazuaki; and Ishikawa, Takatoshi, 5,004,675, Cl. 430-377.000.

Takahashi, Toshimasa: *See*—
Fudono, Kanji; Ogawa, Hiroshi; Takahashi, Toshimasa; and Yamashita, Toshio. 5,003,786, Cl. 62-156.000.

Takahashi, Yasushi; and Yasuda, Hiroshi, to Fujitsu Limited. Method and apparatus for detecting alignment mark of semiconductor device. 5,004,925, Cl. 250-491.100.

Takai, Yasuhiro, to NEC Corporation. Semiconductor device having output buffer circuit controlled by output control signal. 5,005,156, Cl. 365-189.050.

Takaishi, Tadao: *See*—
Umezaki, Tomokazu; and Takaishi, Tadao, 5,003,959, Cl. 123-647.000.

Takamatsu, Akio: *See*—
Tamura, Tatsuya; and Takamatsu, Akio, 5,004,511, Cl. 156-89.000.

Takamiya, Bonnosuke: *See*—
Hatta, Katuhiro; Hiramatsu, Takeo; and Takamiya, Bonnosuke, 5,003,842, Cl. 74-867.000.

Takamuki, Yasuhiko: *See*—
Yamada, Taketoshi; Habu, Takeshi; and Takamuki, Yasuhiko, 5,004,669, Cl. 430-264.000.

Takano, Hirotaka: *See*—
Mori, Tatsuya; Ohsumi, Tadashi; Nakamura, Shigeo; Maeda, Kiyoto; Nishida, Sumio; and Takano, Hirotaka, 5,004,816, Cl. 549-462.000.

Takaoka, Akio; and Inomata, Hiroshi, to Shin-Etsu Chemical Co., Ltd. Fluorine-containing organosilicon compound. 5,004,824, Cl. 556-412.000.

Takara Co., Ltd.: *See*—
Satoh, Yasuta; and Moriyama, Yasuyuki, 5,003,714, Cl. 40-414.000.

Takasaki, Yoshimi; and Horikawa, Kazuo, to Fuji Photo Film Co., Ltd. Logarithmic amplifier, and image read-out apparatus using the same. 5,004,906, Cl. 250-214.00A.

Takasu, Yoshio: *See*—
Arahara, Kozo; Fukui, Tetsuro; Fukumoto, Hiroshi; Katayama, Masato; and Takasu, Yoshio, 5,004,667, Cl. 430-255.000.

Takata, Koji: *See*—
Yamada, Shinji; Kohno, Teruhisa; and Takata, Koji, 5,004,301, Cl. 303-115.000.

Takata, Naoya: *See*—
Sato, Tsuyoshi; Inaba, Masahito; and Takata, Naoya, 5,004,349, Cl. 356-402.000.

Takayama, Syuichi; Tsukaya, Takashi; Ueda, Yasuhiro; Hatta, Shinji; and Abe, Masashi, to Olympus Optical Co., Ltd. Hyperthermia apparatus. 5,003,991, Cl. 128-784.000.

Takdea, Osamu: *See*—
Fukushima, Nobuo; Sakai, Shinji; Takdea, Osamu; Takei, Masahiro; Suzuki, Yasutomo; Okino, Tadashi; and Jinnai, Shigeru, 5,005,088, Cl. 360-69.000.

Takeda Chemical Industries, Ltd.: *See*—
Horii, Satoshi; and Fukase, Hiroshi, 5,004,838, Cl. 568-347.000.

Takeda, Kazuhisa: *See*—
Kim, Soonih; Takeda, Kazuhisa; and Sasatani, Seiei, 5,004,612, Cl. 424-450.000.

Takeda, Toshio, to Aisin Seiki Kabushiki Kaisha. Internal combustion engine with a mechanical super-charger. 5,003,957, Cl. 123-564.000.

Takei, Masahiro: *See*—
Fukushima, Nobuo; Sakai, Shinji; Takdea, Osamu; Takei, Masahiro; Suzuki, Yasutomo; Okino, Tadashi; and Jinnai, Shigeru, 5,005,088, Cl. 360-69.000.

Takenaka, Sadao: *See*—
Aono, Yoshihito; Iwamatsu, Takanori; Minowa, Morihiko; Takenaka, Sadao; Daidoh, Yoshimasa; Nakamura, Hiroshi; and Fujino, Nobutsugu, 5,005,186, Cl. 375-82.000.

Takigawa, Doreen Y.: *See*—
Percec, Elena S.; and Takigawa, Doreen Y., 5,004,783, Cl. 525-77.000.

Takiguchi, Hideki: *See*—
Yagi, Toshihiko; Kumashiro, Kenji; and Takiguchi, Hideki, 5,004,680, Cl. 430-603.000.

Takimoto, Hiroyuki: *See*—
Otokawa, Mitsuhiro; and Takimoto, Hiroyuki, 5,004,965, Cl. 318-254.000.

Takizawa, Nobuyuki: *See*—
Iida, Shoji; Miyazaki, Kazuo; and Takizawa, Nobuyuki, 5,004,857, Cl. 585-507.000.

Talanker, Lev. Embroidery pantograph assembly. 5,003,895, Cl. 112-103.000.

Talish, Roger J., to Meditron Corporation. Medical device for ultrasonic treatment of living tissue and/or cells. 5,003,965, Cl. 128-24.0AA.

Tallentire, Alan; and Sinclair, Colin S., to DRG (UK) Limited. Barrier products. 5,004,645, Cl. 428-323.000.

Talley, Carol S.: *See*—
Norton, Paul R.; Moroz, Michael; and Talley, Carol S., 5,004,698, Cl. 437-3.000.

Tallier, Bernard; and Hagmann, Otto, to Fabriques de Tabac Reunies, S.A. Apparatus for trimming and compression of tobacco. 5,003,996, Cl. 131-84.200.

Tallman, Richard L., to International Superconductor Corp. Method of making superconductor wires by hot isostatic pressing after bending. 5,004,722, Cl. 505-1.000.

Tamura, Hiroshi: *See*—
Haraguchi, Hiroshi; Tamura, Hiroshi; Kodama, Katuhiko; and Kondo, Toshio, 5,003,955, Cl. 123-489.000.

Tamura, Mitsuhisa; Suzukamo, Gohu; and Hirose, Ken-ichi, to Sumitomo Chemical Company, Limited. Process for producing allylic alcohols. 5,004,843, Cl. 568-670.000.

Tamura, Tatsuya; and Takamatsu, Akio, to Petoca Ltd. Process for producing non-woven fabrics of carbon fibers. 5,004,511, Cl. 156-89.000.

Tamura, Yasuyuki; and Kaneko, Shuzo, to Canon Kabushiki Kaisha. Image forming method and transfer recording medium therefor. 5,005,028, Cl. 346-76.00R.

Tamura, Yukio; Kinoshita, Kiyoshi; Uwaji, Tetsuo; and Mizuno, Takashi, to Mitsubishi Jukogyo Kabushiki Kaisha. Plasticizing screw. 5,004,352, Cl. 366-343.000.

Tanahashi, Masaaki; Hagiwara, Hiroyuki; and Fujii, Hiroyuki, to Hitachi Metals Ltd. Take-up apparatus for amorphous metal ribbon. 5,004,172, Cl. 242-54.00R.

Tanaka, Hidehiko, to Mitsubishi Denki Kabushiki Kaisha. Discharge machining apparatus with liquid flow control. 5,004,530, Cl. 204-224.00M.

Tanaka, Hideo: *See*—
Fujita, Shigeru; Tanaka, Hideo; and Harada, Susumu, 5,005,116, Cl. 364-188.000.

Tanaka, Hiroshi: *See*—
Shimizu, Kunimasa; Shigyo, Masao; and Tanaka, Hiroshi, 5,004,917, Cl. 250-236.000.

Tanaka, Masanori: *See*—
Ogawa, Masahide; Sato, Teiji; Tanaka, Masanori; and Takahashi, Noriyuki, 5,004,716, Cl. 501-141.000.

Tanaka, Nobuhiro: *See*—
Tsubone, Akira; Tomiyoshi, Masanori; Yokomizo, Junichi; Tanaka, Nobuhiro; Moriguchi, Hideyuki; and Hirata, Eiji, 5,004,401, Cl. 414-786.000.

Tanaka, Sakae: *See*—
Motai, Noboru; Tanaka, Sakae; and Watanabe, Yoshiaki, 5,005,056, Cl. 357-2.000.

Tanaka, Yukio, to Eastman Kodak Company. Light-emitting diode with light-transmissive film. 5,005,058, Cl. 357-17.000.

Tandem Computers Incorporated: *See*—
Lenoski, Daniel E., 5,005,118, Cl. 364-200.000.

Tanigawa, Masayoshi: *See*—
Tomita, Masahiro; Hayashi, Satoshi; Oda, Shinro; Fujii, Akira; and Tanigawa, Masayoshi, 5,004,945, Cl. 310-328.000.

Tanzawa, Takihei: *See*—
Ueno, Yoshifusa; Tanzawa, Takihei; and Suzuki, Takayuki, 5,004,988, Cl. 331-116.00R.

Tappert, Charles C.: *See*—
Ellozy, Hamed A.; Jeanty, Henry H.; and Tappert, Charles C., 5,005,205, Cl. 382-3.000.

Taraci, Brian: *See*—
Taraci, Richard; Taraci, Brian; and Gorgenyi, Imre, 5,004,973, Cl. 324-158.00R.

Taraci, Richard; Taraci, Brian; and Gorgenyi, Imre, to Thermal Management, Inc. Method and apparatus for maintaining electrically operating device temperatures. 5,004,973, Cl. 324-158.00R.

Tarumi, Noriyoshi: *See*—
Tomono, Makoto; Tarumi, Noriyoshi; and Sato, Masayuki, 5,004,666, Cl. 430-110.000.

Tashima, Seiji: *See*—
Shibata, Masanori; Okimoto, Haruo; Akagi, Toshimichi; and Tashima, Seiji, 5,003,781, Cl. 60-600.000.

Taureg, Herbert, to Viscodrive GmbH. Fluid friction coupling with closing slide. 5,004,085, Cl. 192-58.00B.

Taylor, Charles S.; and Hampton, Hilary J., to Advanced Cardiovascular Systems, Inc. Steerable dilation catheter. 5,003,989, Cl. 128-772.000.

Taylor, Joann: *See*—
Taylor, Sylvester R., III; and Taylor, Joann, 5,004,286, Cl. 296-24.100.

Taylor, John R., to Innovative Building Products, Inc. Glass-block panels with improved thermal conduction characteristics. 5,003,744, Cl. 52-308.000.

Taylor, Raymond F., Jr.: *See*—
Wolf, Charles B.; Dighe, Shyam V.; Martin, Paul E.; Taylor, Raymond F., Jr.; and Melilli, William J., 5,004,888, Cl. 219-121.520.

Taylor, Robert E.: *See*—
Hallam, Donald E.; Popper, Peter; Staunton, Harold F.; Taylor, Robert E.; and Yngve, Paul W., 5,003,763, Cl. 57-297.000.

Taylor, Sylvester R., III; and Taylor, Joann. Transport vehicle protective shield. 5,004,286, Cl. 296-24.100.

Tayon, Jeffrey E.: *See*—
Carlson, Harold L.; DeWitt, Michael D.; Martel, Louis, Jr.; Kelley, Larry W.; and Tayon, Jeffrey E., 5,004,077, Cl. 188-2.00D.

Tazartes, Daniel A.; Mark, John G.; and Mathews, Anthony, to Litton Systems, Inc. Apparatus and method for correcting ring laser gyroscope phase errors at turnaround. 5,004,344, Cl. 356-350.000.

TCH Thermo-Consulting-Heidelberg GmbH: *See*—
Mucic, Vinko; Thieme, Kurt; and Engelmann, Jurgen, 5,004,043, Cl. 165-118.000.

TDK Corporation: *See*—
Okamura, Masatoshi; Namioka, Takashi; and Shiba, Haruo, 5,004,180, Cl. 242-198.000.

Teal, Chuck. Purse light assembly. 5,005,111, Cl. 362-156.000.

Technion Research and Development Foundation Ltd.: *See*—
Beyar, Mordechay; and Foux, Amnon, 5,004,454, Cl. 600-30.000.
Grunfeld, Hay; Lotan, Noah; and Sideman, Samuel, 5,004,547, Cl. 210-635.000.

Technological Safety Design, Inc.: *See*—
Sova, Phillip R., 5,003,906, Cl. 114-211.000.

Technology 21, Inc.: *See*—
Dunseath, W. J., Jr., 5,003,978, Cl. 128-640.000.

Tecres Spa: *See*—
Faccioli, Giovanni; De Bastiani, Basilio M.; Magnan, Bruno; and Soffiatti, Renzo, 5,004,501, Cl. 106-35.000.

Teetz, Christoph: *See*—
Gubon, Peter; Sudmanns, Hans; and Teetz, Christoph, 5,003,934, Cl. 123-52.0MV.

Tektronix, Inc.: *See*—
Falk, Timothy L.; and Rhoads, Geoffrey B., 5,005,145, Cl. 364-571.020.
Jordan, Dale A., 5,004,975, Cl. 324-121.00R.
Widener, Glenn F., 5,004,933, Cl. 307-269.000.

Teledyne Brown Engineering: *See*—
Caulfield, H. John; Hester, Charles F.; Kinser, Jason M.; and Shamir, Joseph, 5,004,309, Cl. 350-3.680.

Teledyne Industries, Inc.: *See*—
Terrell, John; Kadis, Paul M.; Hiney, Leonard L.; and Pfaff, Susan E., 5,003,807, Cl. 72-351.000.

Teleflex Incorporated: *See*—
Pospisil, Joseph, 5,003,838, Cl. 74-502.400.

Teleki, Bela; Holden, Alan G.; and Chong, Leang H., to Johnson Matthey Public Limited Company. Low pass filter system for an electrical circuit. 5,004,991, Cl. 333-168.000.

Temple, Stephen: *See*—
Bartky, W. Scott; Paton, Anthony D.; Temple, Stephen; and Michaelis, A. John, 5,003,679, Cl. 29-25.350.

Tenaillon, Alain: *See*—
Boiteau, Richard; Labayle, Denis; and Tenaillon, Alain, 5,003,657, Cl. 15-104.330.

Terada, Akio: *See*—
Yamamoto, Makoto; and Terada, Akio, 5,005,163, Cl. 369-44.360.

Terada, Nobuhiro; Shimizu, Masataka; and Matsuzawa, Soichiro, to NGK Insulators, Ltd. Method of producing a magnetic head core having track-width defining cut outs formed on opposite side of a magnetic gap. 5,003,688, Cl. 29-603.000.

Terada, Yukio: *See*—
Nakatani, Seiichi; Yuhaku, Satoru; Nishimura, Tsutomu; Terada, Yukio; and Baba, Yasuyuki, 5,004,640, Cl. 428-195.000.

Teradyne, Inc.: *See*—
Barnett, Roy, 5,004,426, Cl. 439-82.000.

Terai, Fumitaka; Yukawa, Kimio; Suyefuji, Mineo; Saito, Hiroki; and Yamaguchi, Shigeru, to Fuji Photo Film Co., Ltd. Coating method and apparatus. 5,004,628, Cl. 427-389.900.

Terai, Masao: *See*—
Saka, Kenji; Terai, Masao; and Yamamoto, Kanji, 5,003,966, Cl. 128-39.000.

Terauchi, Makoto; Ikeda, Chikako; and Aritomi, Mitsutoshi, to Mitsubishi Petrochemical Co., Ltd. Aromatic polythioetherimide. 5,004,800, Cl. 528-351.000.

Terbrusch, Rosemarie; and Spector, George. Trash can with tethered cover. 5,004,114, Cl. 220-296.000.

Terness, Peter; and Opelz, Gerhard, to Fresenius A. G. Immuno-suppressive material and process for preparing same. 5,004,604, Cl. 424-85.500.
Ternstrom, Ingela; and Eriksson, Mats, to Molnlycke AB. Disposable absorbent article. 5,004,465, Cl. 604-385.100.
Terrell, John; Kadis, Paul M.; Hiney, Leonard L.; and Pfaff, Susan E., to Teledyne Industries, Inc. Press assembly and method of operation. 5,003,807, Cl. 72-351.000.
Terrot Strickmaschinen GmbH: *See*—
Leins, Eberhard; and Kunde, Klaus, 5,003,793, Cl. 66-9.00B.
Terumo Kabushiki Kaisha: *See*—
Nogawa, Atsuhiko, 5,004,113, Cl. 215-358.000.
Testoff, Mary A.: *See*—
Schnur, Joel M.; Rudolph, Alan S.; and Testoff, Mary A., 5,004,566, Cl. 260-403.000.
Tetra Pak Holdings & Finance S.A.: *See*—
Reil, Wilheim, 5,004,411, Cl. 425-117.000.
Texaco Inc.: *See*—
Pasternak, Mordechai; Bartels, Craig R.; and Reale, John, Jr., 5,004,861, Cl. 585-818.000.
Texas Instruments Incorporated: *See*—
Andresen, Bernhard H., 5,004,936, Cl. 307-443.000.
Chen, Kueing-Long, 5,005,066, Cl. 357-43.000.
Dent, Peter R.; and Bharya, Rajpal S., 5,005,150, Cl. 364-736.000.
Hariri, Farouk A., 5,004,519, Cl. 156-620.400.
Kleven, Lawrence P.; Agranat, Edward A.; Crisafulli, Jerry; Robinson, Hugh; Smith, David J.; Wiseley, Thomas; Fortier, Richard C.; Johnson, Severne; and Menzin, Marvin, 5,004,954, Cl. 315-106.000.
Martin, Robert C., 5,005,173, Cl. 371-22.600.
Simpson, Richard D., 5,005,193, Cl. 377-33.000.
Sogge, Dale R.; O'Brien, Edward F.; and Czarn, David A., 5,004,876, Cl. 200-83.00P.
Sullivan, Harold W.; and McConnell, Pat M., 5,004,399, Cl. 414-729.000.
Textile Air Company, Inc.: *See*—
Wilson, Merlin C., 5,003,661, Cl. 15-301.000.
Tezuka, Kazunari; and Fujiki, Haruo, to Fuji Jukogyo Kabushiki Kaisha. Traction control system for a four-wheel drive motor vehicle. 5,004,064, Cl. 180-197.000.
Th. Goldschmidt AG: *See*—
Koerner, Gotz; and Schaefer, Dietmar, 5,004,559, Cl. 252-345.000.
Thanos, William N.; Peterson, Bruce R.; Moon, William G.; Lindsay, Joshua; and Stone, Thomas R., to Quantum Corp. High performance, high capacity micro-winchester disk drive. 5,005,089, Cl. 360-77.080.
Theeten, Jean-Bernard: *See*—
Naillon, Martine; and Theeten, Jean-Bernard, 5,005,206, Cl. 382-56.000.
Theisen, Peter J.; Wycklendt, Daniel A.; Juds, Mark A.; and Moldovan, Peter K., to Eaton Corporation. Direct current switching apparatus. 5,004,874, Cl. 200-144.00R.
Thermal Management, Inc.: *See*—
Taraci, Richard; Taraci, Brian; and Gorgenyi, Imre, 5,004,973, Cl. 324-158.00R.
Thermodynetics, Inc.: *See*—
Jones, Brian C., 5,004,046, Cl. 165-156.000.
Thermos Company, Inc., The: *See*—
Hanagan, Joseph J., 5,003,960, Cl. 126-39.0BA.
Theys, Robert A.: *See*—
Lee, Richard J.; Smith, Barbara A.; Theys, Robert G.; Theys, Robert A.; and Murphy, Judy A., 5,004,920, Cl. 250-304.000.
Theys, Robert G.: *See*—
Lee, Richard J.; Smith, Barbara A.; Theys, Robert G.; Theys, Robert A.; and Murphy, Judy A., 5,004,920, Cl. 250-304.000.
Thieme, Kurt: *See*—
Mucic, Vinko; Thieme, Kurt; and Engelmann, Jurgen, 5,004,043, Cl. 165-118.000.
Thomas, John F., to Cargo Master Incorporated. Cargo truck body. 5,004,293, Cl. 296-166.000.
Thominet, Maurice; and Thominet, Rosemarie. Portable, collapsible cellular rack. 5,004,146, Cl. 229-120.310.
Thominet, Rosemarie: *See*—
Thominet, Maurice; and Thominet, Rosemarie, 5,004,146, Cl. 229-120.310.
Thompson, Barry A., to Pich, Rene; Issaurat, Hubert; and Thompson, Barry A. Feeding livestock. 5,004,603, Cl. 424-81.000.
Thompson, David R., to Pico Electronics Limited. Remote control. 5,005,187, Cl. 375-94.000.
Thompson, Douglas: *See*—
Wong, Kin Y.; and Thompson, Douglas, 5,003,826, Cl. 73-828.000.
Thompson, Earl C. Demand type animal watering valve. 5,003,927, Cl. 119-72.500.
Thompson, Robert A., to General Electric Company. Method and system for monitoring shot peening. 5,003,805, Cl. 72-53.000.
Thomson-Brandt Armements: *See*—
Bernard, Marc, 5,004,184, Cl. 244-3.220.
Frehaut, Jean-Pierre; and Pineau, Jean-Pierre, 5,003,882, Cl. 102-387.000.
Joset, Gerard, 5,003,861, Cl. 89-1.550.
Thomson CSF: *See*—
Elleaume, Philippe; and Prevost, Michel, 5,005,149, Cl. 364-728.010.
Ikes, Jacques; Le Fur, Joel; and Nugues, Pierre, 5,004,952, Cl. 315-3.500.
Thomson, Jody: *See*—
Hershenson, Susan; and Thomson, Jody, 5,004,605, Cl. 424-85.600.
Thomson Tubes Electroniques: *See*—
Bergero, Jean-Pierre; and Couasnard, Claude, 5,004,990, Cl. 333-22.00R.
Thorn Emi Flow Measurement Limited: *See*—
Jepson, Peter; and Tofield, Graham M., 5,003,810, Cl. 73-3.000.
Thurston, Kurt W. Interlocking stacking plastic barricades. 5,003,912, Cl. 116-63.00P.
Tibbitts, Gordon A.; and Jones, Mark L., to Eastman Christensen Company. Drill bit with improved steerability. 5,004,057, Cl. 175-408.000.
Tiernan, Joan E. Treatment of concentrated industrial wastewaters originating from oil shale and the like by electrolysis polyurethane foam interaction. 5,004,531, Cl. 204-307.000.
Tietjen, Klaus-Gunther: *See*—
Weissmuller, Joachim; Tietjen, Klaus-Gunther; Stendel, Wilhelm; and Wachendorff-Neumann, Ulrike, 5,004,744, Cl. 514-247.000.
Timmins, Lawrence J.; and Krause, Duane K., to Chrysler Corporation. Rack for transporting vehicle center console assemblies. 5,004,102, Cl. 206-386.000.
Tipton, John P.: *See*—
Mixon, Larry C.; Snyder, George W.; Hill, Scott D.; Johnson, Gregory L.; Wlodarski, J. Frank; von Spakovsky, Alexis P.; Emerson, John D.; Cole, James M.; and Tipton, John P., 5,003,883, Cl. 102-476.000.
Tjassens, Hindrik: *See*—
Kluitmans, Johannes T. M.; and Tjassens, Hindrik, 5,005,178, Cl. 372-36.000.
TMC Corporation: *See*—
Holzl, Klaus, 5,004,261, Cl. 280-612.000.
Tobuse, Hiroaki; Murakami, Hidenobu; and Kamio, Masashi, to Mitsubishi Denki Kabushiki Kaisha. Electron beam direct printing apparatus. 5,005,138, Cl. 364-519.000.
Toda, Akitoshi: *See*—
Matsui, Hiroshi; and Toda, Akitoshi, 5,004,902, Cl. 250-201.800.
Toda, Manabu, to Sharp Kabushiki Kaisha. Cordless telephone apparatus. 5,005,198, Cl. 379-58.000.
Tofield, Graham M.: *See*—
Jepson, Peter; and Tofield, Graham M., 5,003,810, Cl. 73-3.000.
Toft, Malcolm P.: *See*—
Ashton, Michael J.; Bridge, Andrew W.; Chambers, Robert K.; Dron, Donald I.; Fenton, Garry; Harris, Neil V.; Lythgoe, David J.; McFarlane, Ian M.; Newton, Christopher G.; Riddell, David; Smith, Christopher; Stuttle, Keith A. J.; and Toft, Malcolm P., 5,004,747, Cl. 514-309.000.
Tohzuka, Takashi; Yamamoto, Ikuo; and Misugi, Yoshihiko, to Daikin Industries Ltd. Fluorine-containing polyether and lubricant comprising the same. 5,004,554, Cl. 252-54.600.
Toji, Shigeo: *See*—
Suzuki, Noboru; Toji, Shigeo; and Uenaka, Yukio, 5,005,087, Cl. 358-227.000.
Tojo, Tetsuo; Okada, Keiji; Nakahara, Takashi; and Kikuchi, Yoshiharu, to Mitsui Petrochemical Industries, Ltd. Vulcanizable rubber composition with triazine thiols. 5,004,787, Cl. 525-332.100.
Tokai Chemical Industries, Ltd.: *See*—
Kurimoto, Kazunori, 5,004,572, Cl. 264-46.600.
Tokico Ltd.: *See*—
Mizutani, Yoich, 5,004,265, Cl. 280-707.000.
Tokyo Electron Limited: *See*—
Imahashi, Issei, 5,004,924, Cl. 250-442.100.
Tom, Wilson. Multi-bolt door lock. 5,003,796, Cl. 70-107.000.
Tomida, Yoshinori: *See*—
Nishimura, Yukuo; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Nakagiri, Takashi; Saito, Kenji; Kimura, Toshiaki; Matsuda, Hiroshi; Sakai, Kunihiro; and Miyazaki, Toshihiko, 5,004,671, Cl. 430-286.000.
Tomita, Masahiro; Hayashi, Satoshi; Oda, Shinro; Fujii, Akira; and Tanigawa, Masayoshi, to Nippondenso Co., Ltd. Piezoelectric type actuator. 5,004,945, Cl. 310-328.000.
Tomiyama, Akira: *See*—
Tomiyama, Tsuyoshi; Tomiyama, Akira; and Kubota, Koichi, 5,004,750, Cl. 514-382.000.
Tomiyama, Tsuyoshi; Tomiyama, Akira; and Kubota, Koichi, to Kotobuki Seiyaku Company Limited. Benzofuran and benzothoiphene derivatives, of tetrazole and anti-hyperuricemia use thereof. 5,004,750, Cl. 514-382.000.
Tomiyoshi, Masanori: *See*—
Tsubone, Akira; Tomiyoshi, Masanori; Yokomizo, Junichi; Tanaka, Nobuhiro; Moriguchi, Hideyuki; and Hirata, Eiji, 5,004,401, Cl. 414-786.000.
Tomono, Makoto; Tarumi, Noriyoshi; and Sato, Masayuki, to Konica Corporation. Toner for use in developing electrostatic images. 5,004,666, Cl. 430-110.000.
Tomura, Yoshihiro; Maruhashi, Keiji; and Ozawa, Nobuyuki, to Kabushiki Kaisha Pilot. Device for advancing and retracting writing element in writing instrument. 5,004,364, Cl. 401-110.000.
Toray Industries, Inc.: *See*—
Tada, Kuniyuki; Minomiya, Eiichi; and Watanabe, Masatoshi, 5,004,855, Cl. 585-489.000.
Toselli, Vittorio: *See*—
Zanardi, Angelo; Mei, Daniele; and Toselli, Vittorio, 5,004,412, Cl. 418-132.000.
Toshiba Kikai Kabushiki Kaisha: *See*—
Fujita, Shigeru; Tanaka, Hideo; and Harada, Susumu, 5,005,116, Cl. 364-188.000.

Toshiba Lighting & Technology Corporation: *See*—
Honda, Kazuo; Matsuura, Atsushi; and Sano, Hisanori, 5,004,951, Cl. 313-631.000.
Toshiba Silicone Co., Ltd.: *See*—
Nagaoka, Hisayuki; Zenbayashi, Michio; and Shimizu, Chiyuki, 5,004,793, Cl. 528-15.000.
Tosoh Corporation: *See*—
Takahashi, Mitsuru; Shuyama, Hideo; Miyano, Osamu; and Tsutsumi, Yukihiro, 5,004,567, Cl. 260-408.000.
Toyo Denso Kabushiki Kaisha: *See*—
Shibazaki, Toshiji; Okano, Masaru; Kishida, Naoto; Ozaki, Yoshihiro; and Iyama, Kunihiko, 5,004,996, Cl. 338-36.000.
Toyo Elizai Kabushiki Kaisha: *See*—
Uda, Masashi; and Oohira, Jun, 5,004,466, Cl. 604-385.200.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Takahashi, Hiroaki; Okada, Haruo; Matsumoto, Katsuya; and Umino, Masuo, 5,004,546, Cl. 210-635.000.
Toyoda Gosei Co., Ltd.: *See*—
Inoue, Masaki, 5,003,684, Cl. 29-447.000.
Toyoshi, Naoki; Oka, Tateki; and Goto, Hiroshi, to Minolta Camera Kabushiki Kaisha. Developing apparatus with image quality control. 5,003,917, Cl. 118-653.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Imai, Hajime; Kito, Shozo; Harada, Shoichi; Yokoyama, Yoshinobu; Nakamura, Syuzi; Miyoshi, Shigetoshi; and Muramatsu, Tadao, 5,003,799, Cl. 70-247.000.
Kato, Senji; and Oba, Hidehiro, 5,003,950, Cl. 123-422.000.
Takagi, Soya; Mori, Kazuhiko; Kawasaki, Minoru; and Kato, Shinji, 5,004,581, Cl. 420-487.000.
Tracey, Timothy E.: *See*—
Holroyd, Trevor J.; and Tracey, Timothy E., 5,004,985, Cl. 324-727.000.
Tracy, Darrel C. Live picture construction. 5,003,921, Cl. 119-5.000.
Trame, Charles E.; Karsten, Robert A.; and Hobach, Michael W., to Everbrite, Inc. Changeable information scroll sign. 5,003,717, Cl. 40-518.000.
Trans-Action Marketing Corp.: *See*—
Boilen, Irving, 5,005,161, Cl. 368-295.000.
Traudt, Jon E. Pressure controlled fresh air supply ventilation system soil gas pressure as a reference, and method of use. 5,003,865, Cl. 98-1.500.
Triangle Brass Manufacturing Company: *See*—
Campbell, Andrew B.; and Simon, Ira J., 5,004,277, Cl. 292-166.000.
Trident Medical Products, Inc.: *See*—
Bruhl, Daniel E., Jr., 5,004,333, Cl. 351-45.000.
Tripar Incorporated: *See*—
Kersey, Robert L., 5,003,995, Cl. 131-359.000.
Truett, Martha: *See*—
Kuo, George; Masiarz, Frank; Truett, Martha; and Valenzuela, Pablo, 5,004,804, Cl. 530-387.000.
Truth Incorporated: *See*—
Berner, John M.; and Roman, Thomas A., 5,004,961, Cl. 318-65.000.
TRW Inc.: *See*—
Wood, Ruey E., Jr., 5,004,367, Cl. 403-46.000.
Tsantrizos, Youla S.: *See*—
Fortin, J. Andre ; Ogilvie, Kelvin K.; Tsantrizos, Youla S.; and Kope, Harry H., 5,004,754, Cl. 514-570.000.
Tsarapkin, Viktor V.: *See*—
Goikhman, Yakov A.; Krjukov, Georgy M.; Onotsky, Melis I.; Sorokin, Georgy M.; Filatov, Alexei V.; Tsarapkin, Viktor V.; Yakimov, Vadim P.; Smirnov, Gennady A.; Nikiforov, Ivan I.; Burdukovsky, Alexandr I.; Daibov, Sergei V.; and Kurdjukov, Alexandr S., 5,004,056, Cl. 175-293.000.
Tso, J. Yun; and Queen, Cary L., to Protein Design Labs, Inc. Cloning and expression of phospholipase C genes. 5,004,692, Cl. 435-183.000.
Tsubone, Akira; Tomiyoshi, Masanori; Yokomizo, Junichi; Tanaka, Nobuhiro; Moriguchi, Hideyuki; and Hirata, Eiji, to Kao Corporation; and Seibu Electric and Machinery Co., Ltd. Layer palletizing method. 5,004,401, Cl. 414-786.000.
Tsubouchi, Hirohito: *See*—
Gohda, Eiichi; Tsubouchi, Hirohito; Nakayama, Hiroyuki; Hirono, Shuichi; Takahashi, Kozo; Hashimoto, Shuji; and Daikuhara, Yasushi, 5,004,805, Cl. 530-399.000.
Tsuchida, Hirofumi, to Olympus Optical Co., Ltd. Vari-focal lens system. 5,004,329, Cl. 350-427.000.
Tsuchimoto, Shuhei: *See*—
Yoshinouchi, Atsushi; Itoh, Masataka; and Tsuchimoto, Shuhei, 5,004,905, Cl. 250-208.100.
Tsuji, Kazunori: *See*—
Iura, Kazuo; Tsuji, Kazunori; and Saka, Kazuhito, 5,003,761, Cl. 57-58.520.
Tsuji, Masahiro; Kawauchi, Susumu; and Nakayama, Hiroshi, to Nippon Mining Co., Ltd. Method of manufacturing film carrier. 5,004,520, Cl. 156-630.000.
Tsujimoto, Hisanaga, to Kabushiki Kaisha Toshiba. Cassette loading apparatus with single switch control. 5,005,091, Cl. 360-96.500.
Tsujita, Akio: *See*—
Haruki, Shinichi; Furuya, Yhuzi; and Tsujita, Akio, 5,005,051, Cl. 355-221.000.
Tsukahara, Hiroyuki: *See*—
Kakinoki, Yoshikazu; Nakashima, Masato; Koezuka, Tetsuo; Hiraoka, Noriyuki; Tsukahara, Hiroyuki; Suto, Yoshinori; Oshima, Yoshitaka; and Hashinami, Shinji, 5,004,929, Cl. 250-561.000.
Tsukahara, Hitoshi: *See*—
Kato, Koichiro; Fukuhara, Hiroshige; Kamishima, Hiroyuki; and Tsukahara, Hitoshi, 5,005,021, Cl. 343-717.000.
Tsukamoto, Akihiro; and Kobayashi, Keiichi, to Casio Computer Co., Ltd. Pager with a display function. 5,005,013, Cl. 340-825.440.
Tsukamoto, Jack K. Golf ball retriever. 5,004,240, Cl. 273-162.00E.
Tsukaya, Takashi: *See*—
Takayama, Syuichi; Tsukaya, Takashi; Ueda, Yasuhiro; Hatta, Shinji; and Abe, Masashi, 5,003,991, Cl. 128-784.000.
Tsukimoto, Takayuki: *See*—
Kataoka, Kenichi; and Tsukimoto, Takayuki, 5,004,964, Cl. 318-128.000.
Tsuno, Katsushige; and Inoue, Masao, to Jeol Ltd. Differential phase contrast scanning transmission electron microscope. 5,004,918, Cl. 250-311.000.
Tsushima, Kazunori: *See*—
Otaka, Ken; Matsuo, Noritada; Tsushima, Kazunori; and Yano, Toshihiko, 5,004,753, Cl. 514-531.000.
Tsutsumi, Yukihiro: *See*—
Takahashi, Mitsuru; Shuyama, Hideo; Miyano, Osamu; and Tsutsumi, Yukihiro, 5,004,567, Cl. 260-408.000.
Tucker, Donald L., to Raychem Corporation. Electrical connector. 5,004,432, Cl. 439-417.000.
Tulane University: *See*—
Cook, Stephen D., 5,004,476, Cl. 623-23.000.
Tullis, Barclay J.; and Kruger, James B., to Hewlett-Packard Company. Calibration target for surface analysis scanner systems. 5,004,340, Cl. 356-243.000.
Tung, Charles C., to Hewlett-Packard Company. Piece-wise print image enhancement for dot matrix printers. 5,005,139, Cl. 364-519.000.
Tungsram Reszvenytarsasag (Tungsram RT): *See*—
Kinczel, Peter; Balazs, Laszlo ; and Sajo, Gabor, 5,004,948, Cl. 313-486.000.
Turigliatto, Richard S.: *See*—
Cadwallader, George W.; Highfill, Louis A.; Kurdys, Gregory D.; and Turigliatto, Richard S., 5,004,589, Cl. 423-315.000.
Turner, Keith: *See*—
Bradley, Michael W.; Harris, Norman; and Turner, Keith, 5,004,845, Cl. 568-885.000.
Ty Tan, Michael R.; and Wang, Shih-Yuan, to Hewlett-Packard Company. Low loss, low dispersion velocity-matched travelling wave modulator. 5,004,313, Cl. 350-96.140.
Tzelnick, Tzvi: *See*—
Shisgal, Ben Z.; and Tzelnick, Tzvi, 5,004,997, Cl. 340-436.000.
Ube Industries, Ltd.: *See*—
Kuriyama, Minoru, 5,004,038, Cl. 164-305.000.
Uchikawa, Fusaoki: *See*—
Kobayashi, Toshio; Uchikawa, Fusaoki; Nomura, Kenji; Morita, Masao; and Yokoyama, Shouichi, 5,004,720, Cl. 505-1.000.
Uda, Masashi; and Oohira, Jun, to Toyo Elizai Kabushiki Kaisha. Elasticized unit and garment. 5,004,466, Cl. 604-385.200.
Udagawa, Tsunekazu, to Ishikawa Gasket Co., Ltd. Metal plate with a bead. 5,004,250, Cl. 277-236.000.
Udofot, Michael P. Light activated vehicle sensor with flashing light and pulsing sound alarm. 5,005,004, Cl. 340-600.000.
Ueda, Shinji, to Fuji Photo Film Co., Ltd. Method for processing a silver halide color photographic material. 5,004,677, Cl. 430-382.000.
Ueda, Tetsuya, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor card which can be folded. 5,004,899, Cl. 235-492.000.
Ueda, Yasuhiro: *See*—
Takayama, Syuichi; Tsukaya, Takashi; Ueda, Yasuhiro; Hatta, Shinji; and Abe, Masashi, 5,003,991, Cl. 128-784.000.
Uemura, Hiroki: *See*—
Oono, Toshio; and Uemura, Hiroki, 5,004,078, Cl. 188-218.00A.
Uenaka, Yukio: *See*—
Suzuki, Noboru; Toji, Shigeo; and Uenaka, Yukio, 5,005,087, Cl. 358-227.000.
Ueno, Yoshifusa; Tanzawa, Takihei; and Suzuki, Takayuki, to Nihon Dempa Kogyo Co., Ltd. Quartz crystal oscillator with temperature-compensated frequency characteristics. 5,004,988, Cl. 331-116.00R.
UFI, Inc.: *See*—
Miksitz, Frank J., 5,003,920, Cl. 119-163.000.
Ul-Tie-Mate Products, Inc.: *See*—
Dean, Grant, 5,003,929, Cl. 119-120.000.
Ulyanitsky, Vladimir J.; Gavrilenko, Tamara P.; Nikolaev, Jury A.; and Buteev, Alexandr I. Arrangement for conveying powder to the barrel of a gas detonation apparatus. 5,004,021, Cl. 141-67.000.
Umbeck, Paul F., to Agracetus. Genetic engineering of cotton plants and lines. 5,004,863, Cl. 800-205.000.
Umehara, Keiichi; Hirose, Hisashi; and Kono, Kazuo, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Steering angle sensor apparatus. 5,004,915, Cl. 250-231.140.
Umezaki, Tomokazu; and Takaishi, Tadao, to Mitsubishi Denki Kabushiki Kaisha. Ignition coil unit for an internal combustion engine. 5,003,959, Cl. 123-647.000.
Umezawa, Norio: *See*—
Mitsugu, Teruyuki; and Umezawa, Norio, 5,003,836, Cl. 74-425.000.
Umino, Masuo: *See*—
Takahashi, Hiroaki; Okada, Haruo; Matsumoto, Katsuya; and Umino, Masuo, 5,004,546, Cl. 210-635.000.
Underwood, James T. Fly deterrent apparatus. 5,003,721, Cl. 43-132.100.
Unger, William; and Caza, Lawrence A. Keel assembly. 5,003,904, Cl. 114-140.000.

Unilever Patent Holdings B.Y.: *See—*
Bienaime, Patrick, 5,004,147, Cl. 229-198.200.
Union Carbide Chemicals & Plastics Technology Corporation: *See—*
Atkins, Kenneth E.; Gentry, Robert R.; and Gandy, Raymond C., 5,004,765, Cl. 523-434.000.
Union Carbide Corporation: *See—*
Haas, Oscar W.; Prasad, Ravi; and Smolarek, James, 5,004,482, Cl. 55-16.000.
Moore, Arthur W., 5,004,708, Cl. 501-96.000.
Union Carbide Industrial Gases Technology Corporation: *See—*
Litz, Lawrence M.; Weise, Mark K.; and Haid, David A., 5,004,571, Cl. 261-91.000.
Union Oil Company of California: *See—*
Ghandehari, Mohammad H., 5,004,499, Cl. 75-254.000.
Kanne, Diane D., 5,004,480, Cl. 44-387.000.
Kissel, Charles L., 5,004,562, Cl. 252-518.000.
Kissel, Charles L., 5,004,563, Cl. 252-518.000.
Unique Mobility, Inc.: *See—*
Fisher, Gene A., 5,004,944, Cl. 310-266.000.
United Kingdom Atomic Energy Authority: *See—*
Edwards, Stanley A., 5,004,922, Cl. 250-340.000.
United States of America
Administrator, the National Aeronautics and Space Administration: *See—*
Krishen, Kumar; Shaw, Scott W.; and deFigueiredo, Rui J. P., 5,005,147, Cl. 364-578.000.
Agriculture: *See—*
Springer, Edward L.; and Minor, James L., 5,004,523, Cl. 162-76.000.
Air Force: *See—*
Soref, Richard A., 5,004,447, Cl. 350-96.140.
Army: *See—*
Mixon, Larry C.; Snyder, George W.; Hill, Scott D.; Johnson, Gregory L.; Wlodarski, J. Frank; von Spakovsky, Alexis P.; Emerson, John D.; Cole, James M.; and Tipton, John P., 5,003,883, Cl. 102-476.000.
Energy: *See—*
Loo, Billy W.; and Goulding, Frederick S., 5,003,980, Cl. 128-653.00R.
Smither, Robert K., 5,004,319, Cl. 350-162.210.
Health and Human Services: *See—*
Wyatt, Richard J.; Freed, William J.; and Staub, Richard A., 5,004,457, Cl. 604-158.000.
National Aeronautics and Space Administration: *See—*
Johnston, Norman J.; St. Clair, Terry L.; Baucom, Robert M.; and Gleason, John R., 5,004,575, Cl. 264-136.000.
Navy: *See—*
Goldstein, David, 5,003,779, Cl. 60-527.000.
Herold, Stanley J.; Howard, Charles D.; and LaGrange, Donald E., 5,003,881, Cl. 102-337.000.
Jarrett, Bobby R., 5,004,183, Cl. 244-3.110.
Keller, Teddy M.; and Price, Thomas R., deceased, 5,004,801, Cl. 528-360.000.
Lockhart, John C., Jr.; Hartman, Standish C.; Meuron, Bruce R.; and Lyons, Joseph B., Jr., 5,004,185, Cl. 224-3.140.
Moody, Paul E., 5,003,909, Cl. 114-238.000.
Reindel, John, 5,004,993, Cl. 333-208.000.
Walters, Glenn A., 5,005,018, Cl. 342-203.000.
U.S. Philips Corporation: *See—*
Bakker, Jacobus G. C.; and Collet, Marnix G., 5,005,062, Cl. 357-24.000.
Grave, Georges A.; and Gaslonde, Jean-Pierre, 5,005,207, Cl. 388-816.000.
Hasler, Rudolf, 5,004,989, Cl. 331-117.00R.
Kluitmans, Johannes T. M.; and Tjassens, Hindrik, 5,005,178, Cl. 372-36.000.
Martens, Gerhard; Kordts, Jurgen; and Weidinger, Georg, 5,004,912, Cl. 250-227.140.
Naillon, Martine; and Theeten, Jean-Bernard, 5,005,206, Cl. 382-56.000.
Ney, Hermann, 5,005,203, Cl. 381-43.000.
Proksa, Roland; Roschmann, Peter; and van den Berg, Noel J. M., 5,004,983, Cl. 324-322.000.
Schmidt, Konrad; and Kramer, Ralf, 5,005,016, Cl. 341-142.000.
Van Andel, Maarten A.; Van Liempd, Johannes P. J. G.; and Wijn, Josephus M., 5,004,660, Cl. 430-17.000.
Van Berkel, Cornelis H.; Saeijs, Ronald W. J. J.; and Niessen, Cornelius, 5,005,136, Cl. 364-490.000.
Verhulst, Antonius G. H.; Bruinink, Jacob; and Lenders, Emanuel J. W. M., 5,004,322, Cl. 350-320.000.
United Steel Products Co.: *See—*
Young, Daniel E., 5,004,369, Cl. 403-232.100.
United Technologies Corporation: *See—*
Beckwith, Barry M., 5,003,773, Cl. 60-262.000.
Burchette, Herbert L.; Hansen, Lee E.; West, James C.; and Nawrocki, Glen A., 5,004,402, Cl. 415-137.000.
Kester, Jervis D.; and Redington, Clarence P., 5,003,771, Cl. 60-243.000.
Unitrode Corporation: *See—*
Blackstone, Scott C., 5,004,705, Cl. 437-225.000.
Univ. of CA: *See—*
Pardridge, William M., 5,004,697, Cl. 436-547.000.
Universal Company, Ltd.: *See—*
Okada, Kazuo, 5,004,238, Cl. 273-121.00B.
Universite Laval: *See—*
Fortin, J. Andre ; Ogilvie, Kelvin K.; Tsantrizos, Youla S.; and Kope, Harry H., 5,004,754, Cl. 514-570.000.
University of Akron: *See—*
Isayev, Avraam I., 5,004,766, Cl. 524-30.000.
University of Cincinnati: *See—*
Bobst, Albert M.; and Pauley, Gary T., 5,004,809, Cl. 536-29.000.
University of Florida, The: *See—*
Jaeger, Marc J., 5,004,041, Cl. 165-8.000.
University of Georgia Research Foundation, Inc.: *See—*
Miller, Lois K., 5,004,687, Cl. 435-69.100.
Ragland, William L.; and Elfaki, Mohamed G., 5,004,607, Cl. 424-88.000.
University of Pennsylvania: *See—*
Altschuler, Martin D.; and Whittington, Richard, 5,005,143, Cl. 364-554.000.
Chalupa, William; Kronfeld, David S.; Schneider, Paul L.; and Sklan, David, 5,004,728, Cl. 514-12.000.
University of Virginia: *See—*
Merickel, Michael B.; Adams, Ann H.; and Brookeman, James R., 5,003,979, Cl. 128-653.00A.
University of Virginia Alumni Patents Foundation, The: *See—*
Ravdin, Jonathan I.; and Petri, William A., Jr., 5,004,608, Cl. 424-88.000.
Unterforsthuber, Karl; and Koenig, Rudolf, to Bayern-Chemie Gesellschaft fuer flugchemische Antriebe mbH. Gas generator for inflating an inflatable article. 5,003,887, Cl. 102-531.000.
UOP: *See—*
Barger, Paul T.; Barder, Timothy J.; Lin, David Y.; and Hobbs, Simon H., 5,004,853, Cl. 585-481.000.
Gajda, Gregory J., 5,004,858, Cl. 585-667.000.
Kalnes, Tom N.; and James, Robert B., Jr., 5,004,533, Cl. 208-50.000.
Schmidt, Robert J.; Haizmann, Robert S.; Ford, Mark R.; Low, C. David; and Adams, Frank H., 5,004,859, Cl. 585-741.000.
Urabe, Shigeharu: *See—*
Mifune, Hiroyuki; and Urabe, Shigeharu, 5,004,679, Cl. 430-567.000.
Usui Kokusai Sangyo Kaisha, Ltd.: *See—*
Watanabe, Hideaki, 5,004,194, Cl. 248-74.500.
Utton, Donald B.; and Windebank, Stephen R., to NNC Limited. Heat transfer measurement. 5,004,354, Cl. 374-29.000.
Uwaji, Tetsuo: *See—*
Tamura, Yukio; Kinoshita, Kiyoshi; Uwaji, Tetsuo; and Mizuno, Takashi, 5,004,352, Cl. 366-343.000.
Valenzuela, Pablo: *See—*
Kuo, George; Masiarz, Frank; Truett, Martha; and Valenzuela, Pablo, 5,004,804, Cl. 530-387.000.
Valeo Systemes d'Essuyage: *See—*
Gagneux, Georges, 5,004,943, Cl. 310-239.000.
Valeo Thermique Moteur: *See—*
Le Gauyer, Philippe, 5,004,045, Cl. 165-149.000.
Vali, Victor; Chang, David B.; and Brownrigg, Patrick C., to Hughes Aircraft Company. Fiber-optic interferometric chemical sensor. 5,004,914, Cl. 250-227.270.
Van Doorne's Transmissie B.V.: *See—*
Ide, Tohru, 5,004,450, Cl. 474-242.000.
Van Andel, Maarten A.; Van Liempd, Johannes P. J. G.; and Wijn, Josephus M., to U.S. Philips Corporation. Master disc and method of manufacturing a matrix. 5,004,660, Cl. 430-17.000.
Van Berkel, Cornelis H.; Saeijs, Ronald W. J. J.; and Niessen, Cornelius, to U.S. Philips Corporation. Silicon-compiler method and arrangement. 5,005,136, Cl. 364-490.000.
Van Blaircum, Bennie A.; Harwood, Jon W.; and Kimmet, Mark S., to AP Parts Manufacturing Company. Stamp formed muffler with transverse baffle tube. 5,004,069, Cl. 181-282.000.
Vandarakis, Toni L.: *See—*
Montuoro, Lou D.; Vandarakis, Toni L.; and Johnson, Richard L., 5,004,305, Cl. 312-214.000.
van den Berg, Noel J. M.: *See—*
Proksa, Roland; Roschmann, Peter; and van den Berg, Noel J. M., 5,004,983, Cl. 324-322.000.
Van Den Brink, Anthonie, to Eurotool B.V. Injection nozzle for use in an injection moulding device. 5,004,416, Cl. 425-564.000.
van den Burg, Johannes M. E., to Mijnhardt B.V. Flowmeter for gases. 5,003,828, Cl. 73-861.330.
Vanderbilt, Jeffrey J.: *See—*
Devon, Thomas J.; Phillips, Gerald W.; Puckette, Thomas A.; Stavinoha, Jerome L.; and Vanderbilt, Jeffrey J., 5,004,823, Cl. 556-136.000.
Vanderlaan, Robert D., to Pneumo Abex Corporation. Direct drive valve force motor with gain shaping provision. 5,004,940, Cl. 310-36.000.
van der Lely, Ary; and Bom, Cornelis J. G., to C. van der Lely N.V. Devices for spreading granular and/or powdery material. 5,004,163, Cl. 239-661.000.
Van Ketel, Hendrik, to 501 Heerema Engineering Service B.V. Cranes. 5,004,108, Cl. 212-255.000.
Van Leeuwen, Petrus W. N. M.; and Roobeek, Cornelis F., to Shell Oil Company. Process for the reduction of carbonyl compounds. 5,004,844, Cl. 568-880.000.
Van Liempd, Johannes P. J. G.: *See—*
Van Andel, Maarten A.; Van Liempd, Johannes P. J. G.; and Wijn, Josephus M., 5,004,660, Cl. 430-17.000.

Varenchuk, Pavel A.: *See—*
Juschenko, Konstantin A.; Varenchuk, Pavel A.; Kovalev, Valentin D.; Chvertko, Anatoly I.; Privalov, Nikolai T.; and Kuzmenko, Vladimir G., 5,004,885, Cl. 219-73.200.

Varo, Inc.: *See—*
Hanson, Charles M.; Koester, Vaughn J.; and Fallstrom, Robert D., 5,005,213, Cl. 455-617.000.

Varvello, Angelo; Vignotto, Angelo; and Moretti, Roberto, to RIV-SKF Officine di Villar Perosa S.p.A. Device enabling the revolutionary speed to be measured between two parts in relative rotation such as the supports of a vehicle wheel. 5,004,358, Cl. 384-446.000.

Vasquez, Barbara: *See—*
Zdebel, Peter J.; and Vasquez, Barbara, 5,004,703, Cl. 437-67.000.

Vassenaix, Michel; and Milcamps, Jacques, to CGR MeV. Device for the irradiation of a product on both faces. 5,004,926, Cl. 250-492.300.

Vaterlaus, Arthur, to Arva AG. Outlet and flow control device for metallurgical vessels and process. 5,004,130, Cl. 222-590.000.

Vaughn, Walter L.: *See—*
Patton, Robert T.; Vaughn, Walter L.; and McKeand, Thomas J., Jr., 5,004,760, Cl. 521-149.000.

VDO Adolf Schindling AG: *See—*
Mayer, Klaus, 5,003,914, Cl. 116-332.000.

Vega, Julio J.: *See—*
Beaver, Phillip R.; DiGiacinto, Peter M.; Hutchinson, Donald O.; and Vega, Julio J., 5,004,847, Cl. 570-186.000.

Veignat, Norbert: *See—*
Oudet, Claude; Drey, Gilbert; and Veignat, Norbert, 5,003,686, Cl. 29-596.000.

Velke, James D.; and Wright, William R., to Lawn-Wright, Inc. Sulky apparatus attachable to a self-propelled power mower. 5,004,251, Cl. 280-32.700.

Venture Innovations, Inc.: *See—*
House, Roy F.; Wilkinson, Andree H.; and Cowan, Jack C., 5,004,553, Cl. 252-8.510.

Vereinigte Kesselwerke AG: *See—*
Huschauer, Helmuth, 5,003,931, Cl. 122-4.00D.

Verhulst, Antonius G. H.; Bruinink, Jacob; and Lenders, Emanuel J. W. M., to U.S. Philips Corporation. Method of manufacturing an improved electroscopic fluid display. 5,004,322, Cl. 350-320.000.

Vermeire, Dirk V. Hip prosthesis. 5,004,475, Cl. 623-23.000.

Vermeulen, Leon L.; Pauwels, Robert S.; De Smedt, Willy P.; and Vervloet, Ludovicus H., to Agfa-Gevaert, N.V. Dye image receiving material. 5,004,659, Cl. 430-14.000.

Vernerey, Philippe: *See—*
Dufournet, Francois; and Vernerey, Philippe, 5,004,135, Cl. 224-210.000.

Vervloet, Ludovicus H.: *See—*
Vermeulen, Leon L.; Pauwels, Robert S.; De Smedt, Willy P.; and Vervloet, Ludovicus H., 5,004,659, Cl. 430-14.000.

Vesely, Ivan; and Kreitmair, Xaver, to MAN Nutzfahrzeuge GmbH. Tool for fitting and removing brake shoe returns springs. 5,003,680, Cl. 29-227.000.

Vestuti, Emile. Tree grate system. 5,003,724, Cl. 47-25.000.

Vicari, Richard; Costanza, John R.; Lamonte, Ronald R.; and Miano, Ralph M., to Hoechst Celanese Corporation. Preparation of poly(arylate) using a non-solvent. 5,004,796, Cl. 528-179.000.

Vida, Zsuzesanna: *See—*
Jekkel nee Bokany, Antonia; Albrecht, Karoly; Ambrus, Gabor; Lang, Tibor; Szabo, Istvan M.; Ilkoy, Eva; Konczol, Kalman; Moravcsik, Imre; Hantos, Gabor; Simonovits, Emilia; Lengyel nee Szemenyei, Zsuzsanna; Vida, Zsuzesanna; and Csajagi, Eva, 5,004,695, Cl. 435-253.100.

Vidal, Henri; Muelas-Medrano, Santiago; and Segrestin, Pierre, to Vidal, Henri. Facing system. 5,004,376, Cl. 405-284.000.

Viertel, Lothar; Kaiser, Peter; and Welter, Patrick, to Gebr. Happich GmbH. Sun visor for motor vehicle having a slidable main body. 5,004,288, Cl. 296-97.110.

Vigil, Dennis M.: *See—*
Olson, Thomas E.; and Vigil, Dennis M., 5,003,918, Cl. 118-665.000.

Vignos, James H.: *See—*
Kalinoski, Richard W.; Chitty, Gordon W.; and Vignos, James H., 5,003,827, Cl. 73-861.240.

Vignotto, Angelo: *See—*
Varvello, Angelo; Vignotto, Angelo; and Moretti, Roberto, 5,004,358, Cl. 384-446.000.

Vincent, Michael T.: *See—*
Weglarz, Michael W.; Vincent, Michael T.; Prestel, James F.; and Sisoler, Paul G., 5,003,952, Cl. 123-478.000.
Weglarz, Michael W.; Vincent, Michael T.; Prestel, James F.; and Sisoler, Paul G., 5,003,953, Cl. 123-478.000.

Vinyl Corporation: *See—*
Bifano, Gabriel F.; and Reyes, Erenio, 5,003,743, Cl. 52-282.000.

Viscodrive GmbH: *See—*
Taureg, Herbert, 5,004,085, Cl. 192-58.00B.

Vishnitsky, Alexander, to Robert Bosch GmbH. Electrochemical etching apparatus. 5,004,529, Cl. 204-212.000.

Viskase Corporation: *See—*
Stall, Alan D.; and Raudys, Vytas A., 5,003,666, Cl. 452-21.000.

Visnjic, Pero. Procedure for obtaining the preparation for the treatment of the disease psoriasis: drug for the treatment of psoriasis and its application. 5,004,736, Cl. 514-161.000.

Vlannes, Nickolas P., to Environmental Research Institute of Michigan. Method of manufacturing surface relief patterns of variable cross-sectional geometry. 5,004,673, Cl. 430-325.000.

Vogel, Hans-Henning; Rath, Hans P.; Jakob, Claus P.; and Oppenlaender, Knut, to BASF Aktiengesellschaft. Motor fuel for internal combustion engines. 5,004,478, Cl. 44-398.000.

Volmary, William T.: *See—*
Churchill, Jonathan D.; and Volmary, William T., 5,003,948, Cl. 123-352.000.

von Kannewurff, Michael C.: *See—*
Seymour, Raymond K.; Hart, Marshall B.; Magnon, Gary D.; von Kannewurff, Michael C.; and Doughty, Dennis J., 5,004,878, Cl. 200-144.00R.

von Spakovsky, Alexis P.: *See—*
Mixon, Larry C.; Snyder, George W.; Hill, Scott D.; Johnson, Gregory L.; Wlodarski, J. Frank; von Spakovsky, Alexis P.; Emerson, John D.; Cole, James M.; and Tipton, John P., 5,003,883, Cl. 102-476.000.

Vorbrueggen, Helmut: *See—*
Raduechel, Bernd; Skuballa, Werner; Vorbrueggen, Helmut; Loge, Olaf; and Schilliner, Ekkehard, 5,004,752, Cl. 514-530.000.

Votano, Joseph R.: *See—*
Lanza, Richard C.; and Votano, Joseph R., 5,005,195, Cl. 378-62.000.
Lanza, Richard C.; and Votano, Joseph R., 5,005,196, Cl. 378-207.000.

Vrzalik, John H., to Kinetic Concepts, Inc. Method and apparatus for alternating pressure of a low air loss patient support system. 5,003,654, Cl. 5-453.000.

Vsesojuzny Naucho-Issledovatelsky i Proektno-Konstruktorsky Institut Atomnogo Energeticheskogo Machinostroenia USSR: *See—*
Loladze, Teimuraz N.; Batiashvili, Boris I.; Mamulashvili, Gennady L.; Butskhrikidze, David S.; Grdzelishvili, Georgy J.; and Markevich, Jury I., 5,003,728, Cl. 51-165.800.

Vuarnesson, Bernard. Apparatus for viewing a representation of the celestial vault. 5,003,698, Cl. 33-268.000.

Vulcan Chemicals: *See—*
Hirschmann, Robert P.; Beard, William Q., Jr.; Mainz, Eric L.; Smith, Earl B.; and Little, Barry M., 5,004,849, Cl. 570-224.000.

W. H. Brady Co.: *See—*
Wirth, Gary J.; and Jambor, George F., 5,003,797, Cl. 70-180.000.

W. R. Grace & Co.-Conn.: *See—*
Shah, Gautam P., 5,004,647, Cl. 428-349.000.

W & W Musical Instrument Company: *See—*
Krasicki, Walter, Sr.; and Krasicki, Walter, Jr., 5,003,857, Cl. 84-266.000.

Waagen, Geert N.; Bastiaansen, Cornelis W. M.; and Kirschbaum, Robert, to Stamicarbon B.V. Process for the preparation of ultrastretchable polymer material, ultrastretchable material, as well as a process for the manufacture of objects. 5,004,778, Cl. 524-474.000.

Wachendorff-Neumann, Ulrike: *See—*
Weissmuller, Joachim; Tietjen, Klaus-Gunther; Stendel, Wilhelm; and Wachendorff-Neumann, Ulrike, 5,004,744, Cl. 514-247.000.

Wacker-Chemie GmbH: *See—*
Braunling, Hermann; and Becker, Richard, 5,004,560, Cl. 526-258.000.

Wada, Shunichi, to Mitsubishi Denki Kabushiki Kaisha. Controlling circuit for actuator. 5,004,080, Cl. 188-299.000.

Wada, Takaaki: *See—*
Nebashi, Yukichi; and Wada, Takaaki, 5,004,515, Cl. 156-350.000.

Waeber, Rene; Demuth, Robert; Knabenhans, Fritz; and Bachmann, Othmar, to Maschinenfabrik Rieter AG. Apparatus for reducing the stickiness of cotton flocks. 5,003,670, Cl. 19-66.0CC.

Wagner, J. Arthur, to Maxtor Corporation. Actuator for linearizing torque in a disk drive system. 5,005,095, Cl. 360-106.000.

Wagner, Oryn B.; and Alm, Terry J., to Clark Equipment Company. Backhoe mounting device for a skid steer loader. 5,004,398, Cl. 414-723.000.

Wagner, Paul-Heinz. Hydraulic power wrench. 5,003,847, Cl. 81-57.390.

Wahl, Hans-Peter; Schlueter, Rudolf; Kaettlitz, Wolfgang; and Loos, Rolf, to Foseco International Limited. Ceramic foam filter apparatus. 5,004,545, Cl. 210-510.100.

Wakamiya, Masayuki: *See—*
Fukada, Tetsuji; Wakamiya, Masayuki; and Kainou, Kikuo, 5,003,824, Cl. 73-651.000.

Wallace, William D. Medical pressure sensing and display system. 5,004,472, Cl. 606-194.000.

Walse, Alan S.: *See—*
Yagi, Masanori; DiViesti, Anthony M.; Regnier, Kent E.; Yamada, Shoji E.; and Walse, Alan S., 5,004,429, Cl. 439-326.000.

Walsh, Dennis E.: *See—*
DeCaul, Lorenzo C.; Han, Scott; Palermo, Robert E.; and Walsh, Dennis E., 5,004,856, Cl. 585-500.000.

Walter Electrical Manufacturing Company: *See—*
Walter, Gerard S.; and Hagan, John, 5,004,437, Cl. 439-811.000.

Walter, Gerard S.; and Hagan, John, to Walter Electrical Manufacturing Company. Electrical connector blocks. 5,004,437, Cl. 439-811.000.

Walters, Glenn A., to United States of America, Navy. (U) modulator to provide a continuous stepped frequency signal format. 5,005,018, Cl. 342-203.000.

Walz, Rudiger, to Hafele KG. Shelf board fitting. 5,004,200, Cl. 248-250.000.

Wang, David: *See—*
Pluskal, Malcolm G.; Wang, David; and Steuck, Michael J., 5,004,543, Cl. 210-490.000.

Wang, Hong-Jen. Acoustic board. 5,004,070, Cl. 181-286.000.

Wang, Hong W.: *See*—
Cheng, Syh Y.; and Wang, Hong W., 5,004,555, Cl. 252-62.900.
Wang, Po-Kang: *See*—
Krounbi, Mohamad T.; and Wang, Po-Kang, 5,005,096, Cl. 360-113.000.
Wang, Shih-Yuan: *See*—
Ty Tan, Michael R.; and Wang, Shih-Yuan, 5,004,313, Cl. 350-96.140.
Wang, Teresa. Stepping exerciser. 5,004,224, Cl. 272-70.000.
Waranius, William A.: *See*—
Hansen, John S.; and Waranius, William A., 5,004,860, Cl. 585-812.000.
Ward Machinery Company, The: *See*—
Harrison, John R.; and Millard, Michael W., 5,003,876, Cl. 101-350.000.
Ward, Robert W., to General Motors Corporation. Frame and magnet assembly for a dynamoelectric machine. 5,004,577, Cl. 264-112.000.
Warga, Ewald. Pivot arm for apparatus, particularly medical apparatus. 5,004,368, Cl. 403-166.000.
Warner-Lambert Company: *See*—
Chen, Evan N., 5,003,694, Cl. 30-49.000.
Cherukuri, Subraman R.; Chau, Tommy L.; Raman, Krishna P.; and Orama, Angel M., 5,004,595, Cl. 424-48.000.
Wasmer, William D.; Gillespie, Peter J.; Lippmann, James G.; and Le, Hiep M., to Motorola Inc. Rectifier and method. 5,005,069, Cl. 357-72.000.
Watanabe, Hideaki, to Usui Kokusai Sangyo Kaisha, Ltd. Pipe/wire gripping and fixing clamp. 5,004,194, Cl. 248-74.500.
Watanabe, Junji; and Ishikawa, Yuji, to Kabushiki Kaisha Toshiba. Image forming apparatus having vertically movable original cover. 5,005,052, Cl. 355-231.000.
Watanabe, Masatoshi: *See*—
Tada, Kuniyuki; Minomiya, Eiichi; and Watanabe, Masatoshi, 5,004,855, Cl. 585-489.000.
Watanabe, Yoshiaki: *See*—
Motai, Noboru; Tanaka, Sakae; and Watanabe, Yoshiaki, 5,005,056, Cl. 357-2.000.
Watarai, Syu: *See*—
Kondo, Syunichi; and Watarai, Syu, 5,004,641, Cl. 428-208.000.
Watten, Edwin E. Apparatus for improving door security. 5,003,727, Cl. 49-504.000.
Wave Energy Systems, Inc.: *See*—
Boucher, Raymond M. G., 5,004,757, Cl. 514-694.000.
Weaver, Thomas D., to Du Pont de Nemours, E. I., and Company. Direct positive dimethine cyanine dyes containing 1-aryl-2-heteroaryl indole nucleus. 5,004,812, Cl. 546-201.000.
Webb, Brian C.; Pedley, Derek G.; Prosser, Stephen J.; Hijikigawa, Masaya; and Furubayashi, Hisatoshi, to EMI Limited; and Sharp Kabushiki Kaisha. Humidity sensor. 5,004,700, Cl. 437-42.000.
Webb, Nancy A. Garden tool. 5,003,760, Cl. 56-400.060.
Webber, Peter B.: *See*—
Brown, Andrew F.; and Webber, Peter B., 5,004,883, Cl. 219-69.120.
Weber, Gregory T.: *See*—
Moote, Richard K.; Weber, Gregory T.; and Robinson, William O., 5,003,944, Cl. 123-299.000.
Weber, Peter G.: *See*—
Lapeyre, James M.; Weber, Peter G.; and Greve, Christopher G., 5,004,095, Cl. 198-660.000.
Lapeyre, James M.; Weber, Peter G.; and Greve, Christopher G., 5,004,096, Cl. 198-666.000.
Webster, John R., to Rolls-Royce plc. Stress wave load cell. 5,004,059, Cl. 177-210.00R.
Weekley, Karl R. Protective apparatus for a child restraint seat. 5,004,197, Cl. 248-188.900.
Weglarz, Michael W.; Vincent, Michael T.; Prestel, James F.; and Sisoler, Paul G., to Chrysler Corporation. Sequential variable fuel injection. 5,003,952, Cl. 123-478.000.
Weglarz, Michael W.; Vincent, Michael T.; Prestel, James F.; and Sisoler, Paul G., to Chrysler Corporation. Transient fuel injection. 5,003,953, Cl. 123-478.000.
Wehrmann, Rolf: *See*—
Kricheldorf, Hans-Rytger; Delius, Ulrich; and Wehrmann, Rolf, 5,004,836, Cl. 568-333.000.
Weidinger, Georg: *See*—
Martens, Gerhard; Kordts, Jurgen; and Weidinger, Georg, 5,004,912, Cl. 250-227.140.
Weir, Theodore: *See*—
Wislinski, Martin; Bergquist, Roger; Schroeder, Manfred; Weir, Theodore; Monetti, Matthew; and Fung, Paul, 5,004,579, Cl. 264-517.000.
Weise, Mark K.: *See*—
Litz, Lawrence M.; Weise, Mark K.; and Haid, David A., 5,004,571, Cl. 261-91.000.
Weissmuller, Joachim; Tietjen, Klaus-Gunther; Stendel, Wilhelm; and Wachendorff-Neumann, Ulrike, to Bayer Aktiengesellschaft. Pyridazinones as pesticides. 5,004,744, Cl. 514-247.000.
Wellner, Wolfgang: *See*—
Blum, Harald; Meixner, Jurgen; Schreckenberg, Manfred; Fleiter, Lothar; and Wellner, Wolfgang, 5,004,779, Cl. 524-591.000.
Wells, David L. Hand held camera steadying device. 5,005,030, Cl. 354-82.000.
Welter, Patrick: *See*—
Viertel, Lothar; Kaiser, Peter; and Welter, Patrick, 5,004,288, Cl. 296-97.110.
Weng, Kuo-Liang: *See*—
Weng, Kuo-Lianq; and Weng, Kuo-Liang, 5,005,007, Cl. 340-650.000.
Weng, Kuo-Lianq; and Weng, Kuo-Liang, to Yu Li Enterprise Co. Ltd. Alarm device for marine tank. 5,005,007, Cl. 340-650.000.
West Electric Company, Ltd.: *See*—
Hirata, Shinji, 5,004,958, Cl. 315-241.00P.
West, James C.: *See*—
Burchette, Herbert L.; Hansen, Lee E.; West, James C.; and Nawrocki, Glen A., 5,004,402, Cl. 415-137.000.
West, John L., to Kent State University. Extended temperature range polymer dispersed liquid crystal light shutters. 5,004,323, Cl. 350-346.000.
Westinghouse Electric Corp.: *See*—
Bronder, Joseph B.; and Gossard, William H., 5,005,169, Cl. 370-76.000.
Grunert, Kurt A.; Pabon, Delfin; and Cheski, Ronald A., 5,005,104, Cl. 361-355.000.
Kun, Zoltan K.; Cresswell, Michael W.; and Hopkins, Richard H., 5,004,956, Cl. 315-169.300.
Lipchak, John B.; Oblak, Tod A.; Bednar, Fred H.; Ciaramitaro, William; Hughes, Francis R.; Smith, John R.; and Gisoni, Gregory A., 5,005,142, Cl. 364-550.000.
Schauder, Colin D., 5,005,115, Cl. 363-159.000.
Sikora, Gary J., 5,005,017, Cl. 342-172.000.
Winnie, Philip D., 5,004,361, Cl. 411-366.000.
Wolf, Charles B.; Dighe, Shyam V.; Martin, Paul E.; Taylor, Raymond F., Jr.; and Melilli, William J., 5,004,888, Cl. 219-121.520.
Westover, Brooke N. High-speed, high temperature resistance heater and method of making same. 5,004,893, Cl. 219-505.000.
Wettstein, Rick L. Golf club and golf ball cleaning device. 5,004,239, Cl. 273-162.00F.
Whealy, Mary E.: *See*—
Enquist, Lynn W.; Robbins, Alan K.; and Whealy, Mary E., 5,004,693, Cl. 435-235.100.
Wheaton, John M.: *See*—
Natho, Bradford J.; Andrade, George L.; Wheaton, John M.; and Schmitt, Wayne I., 5,004,091, Cl. 190-18.00R.
Wheeler, Grant M.: *See*—
Rush, William B., II; Elder, Jack E.; Shier, Richard K.; Foss, Jerry B.; Haltiner, Karl J., Jr.; and Wheeler, Grant M., 5,003,933, Cl. 123-52.0MC.
Wherley, Fred J.: *See*—
Nagarajan, Madukkarai K.; Wherley, Fred J.; and Frimel, Jody W., 5,004,557, Cl. 252-174.240.
White Consolidated Industries, Inc.: *See*—
Hill, Amos G., 5,003,757, Cl. 56-17.400.
White, Curtis D.; and Carpenter, Billy L., to Nippon Colin Co., Ltd. End tidal respiratory monitor. 5,003,985, Cl. 128-716.000.
White, Loran L. Pipe stabilizing system for underwater use in joining flanged pipe sections. 5,004,017, Cl. 138-106.000.
White, Paul J.: *See*—
Monte, Charles; White, Paul J.; and Graham, Anne C., 5,003,859, Cl. 84-423.00R.
White, Steven L. Cap visor protector. 5,003,639, Cl. 2-187.000.
Whitehead, Jimmy. Cloth warmer. 5,004,894, Cl. 219-521.000.
Whitlock, Arthur D.; and Spector, George. Electromotive fish attractor. 5,003,719, Cl. 43-17.500.
Whittington, Richard: *See*—
Altschuler, Martin D.; and Whittington, Richard, 5,005,143, Cl. 364-554.000.
Wichelhaus, Juergen: *See*—
Emmerling, Winfried; Wichelhaus, Juergen; and Podola, Tore, 5,004,794, Cl. 528-52.000.
Wickramasinghe, Hemantha K.: *See*—
Martin, Yves; and Wickramasinghe, Hemantha K., 5,003,815, Cl. 73-105.000.
Widener, Glenn F., to Tektronix, Inc. Phase-selectable flip-flop. 5,004,933, Cl. 307-269.000.
Widmer, Hanspeter: *See*—
Kung, Roland; and Widmer, Hanspeter, 5,005,209, Cl. 455-32.000.
Wiencek, Norbert: *See*—
Petzold, Rainer; Fritz, Walter; and Wiencek, Norbert, 5,004,086, Cl. 192-85.00C.
Wiese, Michael: *See*—
Neumann, Andreas; and Wiese, Michael, 5,004,101, Cl. 206-343.000.
Wijn, Josephus M.: *See*—
Van Andel, Maarten A.; Van Liempd, Johannes P. J. G.; and Wijn, Josephus M., 5,004,660, Cl. 430-17.000.
Wilde, Eugen: *See*—
Goessler, Gerhard; Wilde, Eugen; and Seeburger, Rolf, 5,004,892, Cl. 219-464.000.
Wilfong, Debra L.: *See*—
Salaba, Timothy A.; and Wilfong, Debra L., 5,004,351, Cl. 366-152.000.
Wilhelm Fette GmbH: *See*—
Hinzpeter, Juergen; and Gruedelbach, Hans-Dieter, 5,004,576, Cl. 264-40.500.
Wilhelm, Gary L.: *See*—
Lipscomb, Dennis E.; Wilhelm, Gary L.; Perna, Barbara G.; and Guenthner, Waldemar G., 5,003,695, Cl. 30-193.000.
Wilken-Trenkamp, Ludger: *See*—
Stude, Rolf-Rudiger; and Wilken-Trenkamp, Ludger, 5,004,414, Cl. 425-185.000.

Wilkes, Lambert H.; Mehner, Martin; and Lalor, William F., to Cotton Incorporated. Method and apparatus for reorienting seed cotton on a ginning apparatus. 5,003,669, Cl. 19-49.000.

Wilkinson, Andree H.: *See*—
House, Roy F.; Wilkinson, Andree H.; and Cowan, Jack C., 5,004,553, Cl. 252-8.510.

Wilkinson, Bruce S., to Rule Industries, Inc. Anchor. 5,003,910, Cl. 114-304.000.

William Prym-Werke GmbH. & Co. KG: *See*—
Nysten, Bernhard, 5,003,673, Cl. 24-662.000.

Williams, Farrell D.: *See*—
Stamp, Roger A.; and Williams, Farrell D., 5,003,646, Cl. 4-542.000.

Williams, James. Disposable shower liner. 5,003,647, Cl. 4-559.000.

Williams, Keith G.: *See*—
Culbertson, Samuel W.; and Williams, Keith G., 5,004,403, Cl. 417-53.000.

Williams, Robert C.: *See*—
Hughes, Robert J.; and Williams, Robert C., 5,003,701, Cl. 33-409.000.

Willkens, Craig A.: *See*—
Hay, Robert A.; Willkens, Craig A.; and Arsenault, Normand P., 5,004,544, Cl. 210-490.000.

Wilson, David: *See*—
Chaney, Raymond J.; McMurtry, David R.; and Wilson, David, 5,004,982, Cl. 324-207.220.

Wilson, Ewert J. A., to Interstate Chemical, Inc. Blended gasolines. 5,004,850, Cl. 585-1.000.

Wilson, Geoffrey G.: *See*—
Chen, Shu-zi; and Wilson, Geoffrey G., 5,004,691, Cl. 435-172.300.

Wilson, Joseph E. Methods for rendering plastics thromboresistant and product. 5,004,461, Cl. 604-265.000.

Wilson, Merlin C., to Textile Air Company, Inc. Forced air apparatus for directing filtered air against a surface. 5,003,661, Cl. 15-301.000.

Wilson, Robert A. Control and limiting of oil spills from an ocean going tanker. 5,003,908, Cl. 114-229.000.

Wilson, William B.; DiPietro, Matthew; Neace, Richard K.; Dethier, Vincent B.; Hauss, Raymond G.; and Louk, James R., to Eastman Kodak Company. Processing apparatus. 5,005,036, Cl. 354-322.000.

Wilston, Arthur, to Structural Block Systems, Inc. Arcuate and curvilinear assemblies comprising tandemly arranged building blocks having degrees of rotation. 5,003,746, Cl. 52-589.000.

Windebank, Stephen R.: *See*—
Utton, Donald B.; and Windebank, Stephen R., 5,004,354, Cl. 374-29.000.

Windrem, Ron. Automatic flag for rural mailbox. 5,004,148, Cl. 232-35.000.

Winfrey, Laura J.: *See*—
Hillman, Robert S.; Cobb, Michael E.; Allen, Jimmy D.; Gibbons, Ian; Ostoich, Vladimir E.; and Winfrey, Laura J., 5,004,923, Cl. 250-341.000.

Winnie, Philip D., to Westinghouse Electric Corp. Fastener for use at cryogenic temperatures, and tool therefor. 5,004,361, Cl. 411-366.000.

Winters, Mark A., to SRI International. Method to detect fungi and yeasts. 5,004,699, Cl. 435-7.310.

Winters, Robert C.: *See*—
Bernhardt, Everett A.; and Winters, Robert C., 5,004,879, Cl. 200-295.000.

Wirth, Gary J.; and Jambor, George F., to W. H. Brady Co. Lockout device for valves with lever handles. 5,003,797, Cl. 70-180.000.

Wiseley, Thomas: *See*—
Kleven, Lawrence P.; Agranat, Edward A.; Crisafulli, Jerry; Robinson, Hugh; Smith, David J.; Wiseley, Thomas; Fortier, Richard C.; Johnson, Severne; and Menzin, Marvin, 5,004,954, Cl. 315-106.000.

Wislinski, Martin; Bergquist, Roger; Schroeder, Manfred; Weir, Theodore; Monetti, Matthew; and Fung, Paul, to McNeil-PPC-Inc. Methods and apparatus for selective placement of fibrous material in formed fibrous articles. 5,004,579, Cl. 264-517.000.

Wlodarski, J. Frank: *See*—
Mixon, Larry C.; Snyder, George W.; Hill, Scott D.; Johnson, Gregory L.; Wlodarski, J. Frank; von Spakovsky, Alexis P.; Emerson, John D.; Cole, James M.; and Tipton, John P., 5,003,883, Cl. 102-476.000.

Woehrl, Alfons: *See*—
Spies, Hans; Woehrl, Alfons; and Spies, Martin, 5,005,085, Cl. 358-213.110.

Wojtowicz, John A.: *See*—
Wood, Richard B.; Mullins, Richard M.; and Wojtowicz, John A., 5,004,549, Cl. 210-699.000.

Woldvedt, Alan H.: *See*—
Dickie, Gerald M.; Liles, Steve L.; and Woldvedt, Alan H., 5,004,372, Cl. 405-63.000.

Wolf, Charles B.; Dighe, Shyam V.; Martin, Paul E.; Taylor, Raymond F., Jr.; and Melilli, William J., to Westinghouse Electric Corp. Plasma torch with extended life electrodes. 5,004,888, Cl. 219-121.520.

Wolff, Erich: *See*—
Meckl, Heinz; Klotzer, Sieghart; Wolff, Erich; and Haseler, Helmut, 5,004,676, Cl. 430-398.000.

Won, John. Sound and/or light generating device for skateboards. 5,004,256, Cl. 280-87.042.

Wong, Dorothy Y. Automobile mat and securing clip. 5,003,664, Cl. 16-6.000.

Wong, John J.; and Lui, Paul S., to Macronix, Inc. Computer game cartridge security circuit. 5,004,232, Cl. 273-435.000.

Wong, Kin Y.; and Thompson, Douglas, to Boeing Company, The. Apparatus for supporting a long cable for tension testing. 5,003,826, Cl. 73-828.000.

Wong, Marvin G.: *See*—
Altendorf, John M.; and Wong, Marvin G., 5,005,070, Cl. 357-74.000.

Wood, Richard B.; Mullins, Richard M.; and Wojtowicz, John A., to Olin Corporation. Method for inhibiting scale formation using calcium hypochlorite compositions. 5,004,549, Cl. 210-699.000.

Wood, Ruey E., Jr., to TRW Inc. Turnbuckle assembly. 5,004,367, Cl. 403-46.000.

Wood, Thomas H., to AT&T Bell Laboratories. Interference suppression in optical communication systems. 5,005,212, Cl. 455-606.000.

Woodward, Adrian M.: *See*—
Lyons, Nicholas; Baxter, William R. S.; Woodward, Adrian M.; and Clarke, Roger W., 5,004,542, Cl. 210-356.000.

Worthington, Paul A.: *See*—
Sugavanam, Balasubramanyan; Worthington, Paul A.; and Clough, John M., 5,004,494, Cl. 71-92.000.

Wright, John W.: *See*—
Hoodenpyle, James W.; Robinson, James P.; and Wright, John W., 5,003,818, Cl. 73-121.000.

Wright, Randall J. Level vial with extender pitch range. 5,003,699, Cl. 33-379.000.

Wright, William R.: *See*—
Velke, James D.; and Wright, William R., 5,004,251, Cl. 280-32.700.

Wu, Jiin-Tang. Structure of golf score board. 5,004,137, Cl. 224-274.000.

Wu, Jiin-Tang. Drag bar mounting structure for a golf bag drag carriage. 5,004,254, Cl. 280-47.315.

Wu, Samuel C.: *See*—
Brossia, Charles E.; and Wu, Samuel C., 5,005,005, Cl. 340-604.000.

Wyatt, Charles H.: *See*—
Eller, Joe C.; Leavens, James E.; and Wyatt, Charles H., 5,004,483, Cl. 55-20.000.

Wyatt, Richard J.; Freed, William J.; and Staub, Richard A., to United States of America, Health and Human Services. Tissue transplantation system. 5,004,457, Cl. 604-158.000.

Wycklendt, Daniel A.: *See*—
Theisen, Peter J.; Wycklendt, Daniel A.; Juds, Mark A.; and Moldovan, Peter K., 5,004,874, Cl. 200-144.00R.

Wycliffe, Paul A.: *See*—
Hunter, John A.; Scamans, Geoffrey M.; O'Callaghan, Wilfred B.; and Wycliffe, Paul A., 5,004,654, Cl. 429-50.000.

Wyers, Philip W. Detachable article carrier assembly. 5,004,133, Cl. 224-42.45R.

Wysk, Wolfram: *See*—
Dethlefs, Ralf-Burkhard; Scholz, Bernd; Wysk, Wolfram; and Miefert, Elke, 5,004,644, Cl. 428-323.000.

XAAR Limited: *See*—
Bartky, W. Scott; Paton, Anthony D.; Temple, Stephen; and Michaelis, A. John, 5,003,679, Cl. 29-25.350.

Xerox Corporation: *See*—
Badesha, Santokh S.; Stolka, Milan; Pai, Damodar M.; and Abkowitz, Martin A., 5,004,663, Cl. 430-59.000.
Fuller, Timothy J.; Marchessault, Robert H.; and Bluhm, Terry L., 5,004,664, Cl. 430-106.600.
Law, Kock-Yee; and Bailey, F. Courtney, 5,004,661, Cl. 430-59.000.
Sardano, Peter A.; and Kazmierczak, Irvin J., 5,004,218, Cl. 271-35.000.
Stokes, Ronald E.; Nowak, William J.; Attardi, Anthony A.; and Costanza, Daniel W., 5,005,054, Cl. 355-273.000.

Yacoub, Naseem: *See*—
Landa, Benzion; Hochman, Haim; and Yacoub, Naseem, 5,004,165, Cl. 241-21.000.

Yada, Akira; and Matsumoto, Shusaku, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Process for continuously preparing acrylic polymer gel. 5,004,761, Cl. 522-3.000.

Yagawa, Hiroshi, to AMP Incorporated. Optical fiber cable-stripping device. 5,003,846, Cl. 81-9.420.

Yagawara, Shinji; Manaka, Junji; and Ohta, Wasaburo, to Ricoh Company, Ltd. Gas detecting device. 5,003,812, Cl. 73-31.060.

Yagi, Masanori; DiViesti, Anthony M.; Regnier, Kent E.; Yamada, Shoji E.; and Walse, Alan S., to Molex Incorporated. Metal latch for SIMM socket. 5,004,429, Cl. 439-326.000.

Yagi, Toshihiko; Kumashiro, Kenji; and Takiguchi, Hideki, to Konica Corporation. High-speed and well-preservable silver halide photographic light-sensitive material. 5,004,680, Cl. 430-603.000.

Yagihara, Morio: *See*—
Okutsu, Eiichi; Hirano, Mitsunori; and Yagihara, Morio, 5,004,670, Cl. 430-265.000.

Yahata, Makoto; and Nishida, Fumihiko, to Dainippon Screen Mfg. Co., Ltd. Automatic masking device. 5,005,044, Cl. 355-40.000.

Yakimov, Vadim P.: *See*—
Goikhman, Yakov A.; Krjukov, Georgy M.; Onotsky, Melis I.; Sorokin, Georgy M.; Filatov, Alexei V.; Tsarapkin, Viktor V.; Yakimov, Vadim P.; Smirnov, Gennady A.; Nikiforov, Ivan I.; Burdukovsky, Alexandr I.; Daibov, Sergei V.; and Kurdjukov, Alexandr S., 5,004,056, Cl. 175-293.000.

Yakuwa, Masahiko; Itoh, Tomofumi; and Igarashi, Hisashi, to Honda Giken Kogyo Kabushiki Kaisha. Fail-safe device for temperature sensors. 5,003,954, Cl. 123-479.000.

Yalpani, Manssur; and Abdel-Malik, Magdy M., to Domtar Inc. Aminoalkyl-derivatives of hydroxyalkyl-celluloses. 5,004,808, Cl. 536-56.000.

Yamada, Kaneo: *See*—
Hayashi, Shigeru; and Yamada, Kaneo, 5,004,609, Cl. 424-94.300.
Yamada, Koji: *See*—
Yasuzawa, Toru; Nakanishi, Satoshi; Murakata, Chikara; Kase, Hiroshi; Sano, Hiroshi; and Yamada, Koji, 5,004,833, Cl. 536-18.200.
Yamada, Noriyuki: *See*—
Matsumoto, Yukihiro; Yoshihara, Kenji; Kajiura, Tetsuya; Niizato, Tomonori; and Yamada, Noriyuki, 5,003,937, Cl. 123-90.120.
Yamada, Shinji; Kohno, Teruhisa; and Takata, Koji, to Sumitomo Electric Industries, Ltd. Modulator for use in an anti-lock brake control system. 5,004,301, Cl. 303-115.000.
Yamada, Shoji E.: *See*—
Yagi, Masanori; DiViesti, Anthony M.; Regnier, Kent E.; Yamada, Shoji E.; and Walse, Alan S., 5,004,429, Cl. 439-326.000.
Yamada, Taketoshi; Habu, Takeshi; and Takamuki, Yasuhiko, to Konica Corporation. Light-sensitive silver halide photographic material. 5,004,669, Cl. 430-264.000.
Yamaguchi, Shigeru: *See*—
Terai, Fumitaka; Yukawa, Kimio; Suyefuji, Mineo; Saito, Hiroki; and Yamaguchi, Shigeru, 5,004,628, Cl. 427-389.900.
Yamaguchi, Tadamasa: *See*—
Sakaguchi, Shuichi; Yamaguchi, Tadamasa; and Yamashita, Itaru, 5,004,884, Cl. 219-73.000.
Yamaguchi, Takeshi: *See*—
Sakamoto, Noriaki; Maeda, Shigemi; Yamanaka, Toshihiro; Deguchi, Toshihisa; Horie, Nobuyuki; Yamaguchi, Takeshi; and Kojima, Kunio, 5,005,164, Cl. 369-48.000.
Yamaguchi, Yoh-Ichi: *See*—
Kobayashi, Masato; Yamaguchi, Yoh-Ichi; Sugawara, Minoru; and Yamashiro, Kazuhide, 5,005,075, Cl. 378-35.000.
Yamaha Corporation: *See*—
Furukawa, Kazunari, 5,004,066, Cl. 181-160.000.
Makino, Toru, 5,004,521, Cl. 156-645.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Yoshida, Takeo; and Kishida, Hajime, 5,004,154, Cl. 239-96.000.
Yamakawa, Tsutomu; and Kobayashi, Hiroaki, to Kabushiki Kaisha Toshiba. Method and system for controlling gain and offset in radiation measurement apparatus. 5,004,904, Cl. 250-207.000.
Yamamoto, Ikuo: *See*—
Tohzuka, Takashi; Yamamoto, Ikuo; and Misugi, Yoshihiko, 5,004,554, Cl. 252-54.600.
Yamamoto, Kanji: *See*—
Saka, Kenji; Terai, Masao; and Yamamoto, Kanji, 5,003,966, Cl. 128-39.000.
Yamamoto, Kazuo, to Nippon Seiko Kabushiki Kaisha. Mechanism for positional adjustment of anchor for webbing in passive seat belt system for vehicle. 5,004,268, Cl. 280-804.000.
Yamamoto, Kazuo: *See*—
Kitamura, Koichi; Mimura, Hidenori; Yamamoto, Kazuo; and Ohta, Yasumitsu, 5,004,903, Cl. 250-208.100.
Yamamoto, Makoto; and Terada, Akio, to Nakamichi Corp. Level shift circuit of optical disc apparatus. 5,005,163, Cl. 369-44.360.
Yamamoto, Tatsuo: *See*—
Miyake, Teruyoshi; and Yamamoto, Tatsuo, 5,003,638, Cl. 2-167.000.
Yamamoto, Tetsushi; Niwano, Masaru; and Nakagawa, Etsuo, to Chisso Corporation. Apparatus for stabilization treatment of ferromagnetic metal powder. 5,003,919, Cl. 118-716.000.
Yamamoto, Yohzoh; Ishiwata, Shuichi; Yokoyama, Kenji; and Hasegawa, Kimio, to Mitsui Petrochemical Industries, Ltd.; and NEC Environment Engineering, Ltd. Composition for vibration damper, process for manufacture thereof, and vibration damper. 5,004,764, Cl. 523-400.000.
Yamanaka, Toshihiro; Maeda, Shigemi; and Horie, Nobuyuki, to Sharp Kabushiki Kaisha. Method for managing information on a storage media without losing information due to effects. 5,005,165, Cl. 369-58.000.
Yamanaka, Toshihiro: *See*—
Sakamoto, Noriaki; Maeda, Shigemi; Yamanaka, Toshihiro; Deguchi, Toshihisa; Horie, Nobuyuki; Yamaguchi, Takeshi; and Kojima, Kunio, 5,005,164, Cl. 369-48.000.
Yamasaki, Komei; and Funaki, Keisuke, to Idemitsu Kosan Co., Ltd. Resin laminates and a process for production thereof. 5,004,649, Cl. 428-461.000.
Yamashiro, Kazuhide: *See*—
Kobayashi, Masato; Yamaguchi, Yoh-Ichi; Sugawara, Minoru; and Yamashiro, Kazuhide, 5,005,075, Cl. 378-35.000.
Yamashita, Itaru: *See*—
Sakaguchi, Shuichi; Yamaguchi, Tadamasa; and Yamashita, Itaru, 5,004,884, Cl. 219-73.000.
Yamashita, Masami: *See*—
Oshima, Hisaichi; and Yamashita, Masami, 5,005,027, Cl. 346-76.0PH.
Yamashita, Toshio: *See*—
Fudono, Kanji; Ogawa, Hiroshi; Takahashi, Toshimasa; and Yamashita, Toshio, 5,003,786, Cl. 62-156.000.
Yamauchi, Hiroto: *See*—
Amano, Tetsuya; Mita, Seiichi; Izumita, Morishi; Doi, Nobukazu; Kaneko, Mamoru; Yamauchi, Hiroto; and Kasai, Susumu, 5,005,184, Cl. 375-14.000.
Yamazaki, Etsuo; Iehisa, Nobuaki; and Suzuki, Kazuhiro, to Fanuc Ltd. Laser power controlling method. 5,004,889, Cl. 219-121.610.
Yamazaki, Toshio. Automobile side door extendable and retractable bump protector. 5,004,281, Cl. 293-118.000.
Yan, Tsoung Y., to Mobil Oil Corp. Pseudocumene and mesitylene production and coproduction thereof with xylene. 5,004,854, Cl. 585-489.000.
Yanagida, Jun: *See*—
Oohinata, Osamu; and Yanagida, Jun, 5,003,660, Cl. 15-244.100.
Yanagisawa, Kiyoshi: *See*—
Sase, Toshitsugu; Matsuda, Michiaki; Yanagisawa, Kiyoshi; and Maeda, Mitsuru, 5,004,068, Cl. 181-276.000.
Yang, Nan L.: *See*—
Broussard, Jerry A.; Auerbach, Andrew B.; Yang, Nan L.; Paul, James L.; Zheng, Yong C.; and Zhang, Chong L., 5,004,798, Cl. 528-230.000.
Yang, Wen C. Stem having a fixing device. 5,003,839, Cl. 74-551.100.
Yano, Tadashi; and Hamada, Kenichi, to Mitsubishi Jukogyo Kabushiki Kaisha. Printing apparatus inker with end dams. 5,003,877, Cl. 101-363.000.
Yano, Toshihiko: *See*—
Otaka, Ken; Matsuo, Noritada; Tsushima, Kazunori; and Yano, Toshihiko, 5,004,753, Cl. 514-531.000.
Yarita, Ikuo: *See*—
Kenmochi, Kazuhito; Yarita, Ikuo; Fukuhara, Akihiko; Komatu, Tomio; and Kishida, Akira, 5,003,804, Cl. 72-39.000.
Yasuda, Hiroshi: *See*—
Takahashi, Yasushi; and Yasuda, Hiroshi, 5,004,925, Cl. 250-491.100.
Yasui, Hideaki: *See*—
Kozaki, Tetsuji; Ishikawa, Hiroshi; Yasui, Hideaki; Shimamoto, Mamoru; Hibino, Katsuhiko; and Suzuki, Motoshi, 5,004,264, Cl. 280-707.000.
Yasuzawa, Toru; Nakanishi, Satoshi; Murakata, Chikara; Kase, Hiroshi; Sano, Hiroshi; and Yamada, Koji, to Kyowa Hakko Kogyo Co., Ltd. KS-501 derivatives. 5,004,833, Cl. 536-18.200.
Yazaki Corporation: *See*—
Misaki, Takashi; and Aoki, Hitoshi, 5,005,010, Cl. 340-705.000.
Yeh, Felix W. H.: *See*—
Chen, Hai C.; and Yeh, Felix W. H., 5,004,076, Cl. 187-130.000.
Yeh, Kuo-Huei. Structure of multi-function frame members. 5,003,741, Cl. 52-280.000.
Yeo, Jong K.; Kim, Chung S.; Lee, Dong J.; and Jang, Sung H., to Lucky, Ltd. Thermosetting polyimide resin composition. 5,004,774, Cl. 524-262.000.
Yin, Simon, to Square D Company. Vacuum interrupter. 5,004,877, Cl. 200-144.00B.
Yngve, Paul W.: *See*—
Hallam, Donald E.; Popper, Peter; Staunton, Harold F.; Taylor, Robert E.; and Yngve, Paul W., 5,003,763, Cl. 57-297.000.
Yokoe, Masaaki; Kurono, Yoshikazu; and Hayashi, Koji, to Brother Kogyo Kabushiki Kaisha. Sewing system. 5,003,897, Cl. 112-121.120.
Yokomizo, Junichi: *See*—
Tsubone, Akira; Tomiyoshi, Masanori; Yokomizo, Junichi; Tanaka, Nobuhiro; Moriguchi, Hideyuki; and Hirata, Eiji, 5,004,401, Cl. 414-786.000.
Yokoyama, Kenichi: *See*—
Sato, Kiyoshi; Yoshikawa, Hirokazu; Ikenari, Shigeru; and Yokoyama, Kenichi, 5,004,656, Cl. 429-162.000.
Yokoyama, Kenji: *See*—
Yamamoto, Yohzoh; Ishiwata, Shuichi; Yokoyama, Kenji; and Hasegawa, Kimio, 5,004,764, Cl. 523-400.000.
Yokoyama, Shouichi: *See*—
Kobayashi, Toshio; Uchikawa, Fusaoki; Nomura, Kenji; Morita, Masao; and Yokoyama, Shouichi, 5,004,720, Cl. 505-1.000.
Yokoyama, Yoshinobu: *See*—
Imai, Hajime; Kito, Shozo; Harada, Shoichi; Yokoyama, Yoshinobu; Nakamura, Syuzi; Miyoshi, Shigetoshi; and Muramatsu, Tadao, 5,003,799, Cl. 70-247.000.
Yokoyama, Yoshio: *See*—
Fushiya, Fusao; Yokoyama, Yoshio; and Hara, Akihito, 5,004,140, Cl. 227-8.000.
Yoneda, Tetsuya; and Sato, Shin, to Sharp Kabushiki Kaisha. Battery. 5,004,657, Cl. 429-193.000.
Yoneyama, Hiroyuki; Takahashi, Osamu; Yoshida, Kazuaki; and Ishikawa, Takatoshi, to Fuji Photo Film Co., Ltd. Method for processing a silver halide photosensitive material for color photography. 5,004,675, Cl. 430-377.000.
Yoneyama, Syuichi; Obana, Yoshinori; and Fujisawa, Eiichi, to Nissan Motor Co., Ltd. Ignition coil mounting structure for engine. 5,003,958, Cl. 123-635.000.
Yoshida, Kazuaki: *See*—
Yoneyama, Hiroyuki; Takahashi, Osamu; Yoshida, Kazuaki; and Ishikawa, Takatoshi, 5,004,675, Cl. 430-377.000.
Yoshida, Takeo; and Kishida, Hajime, to Yamaha Hatsudoki Kabushiki Kaisha. High pressure fuel injection device for engine. 5,004,154, Cl. 239-96.000.
Yoshida, Tutomu; and Iida, Shigeharu, to Daikin Industries Ltd. Process for preparing di(fluoroalkyl containing group-substituted alkyl) phosphate salt. 5,004,825, Cl. 558-131.000.
Yoshihara, Kenji: *See*—
Matsumoto, Yukihiro; Yoshihara, Kenji; Kajiura, Tetsuya; Niizato, Tomonori; and Yamada, Noriyuki, 5,003,937, Cl. 123-90.120.
Yoshikawa, Hirokazu: *See*—
Sato, Kiyoshi; Yoshikawa, Hirokazu; Ikenari, Shigeru; and Yokoyama, Kenichi, 5,004,656, Cl. 429-162.000.
Yoshimoto, Kyosuke; and Shimoda, Kyouji, to Mitsubishi Denki Kabushiki Kaisha. Current mirror amplifier for use in an optical data medium driving apparatus and servo-circuit. 5,004,901, Cl. 250-201.500.

Yoshino, Masato, to Sumitomo Electric Industries, Ltd. Antilock brake control device. 5,005,132, Cl. 364-426.020.

Yoshino Seiki Inc.: *See*—
Yoshino, Yousuke, 5,004,382, Cl. 408-60.000.

Yoshino, Yoshimi; Ao, Kenichi; Izawa, Ichiro; and Arasuna, Toshikazu, to Nippondenso Co., Ltd. Device for detecting magnetism. 5,005,064, Cl. 357-27.000.

Yoshino, Yousuke, to Yoshino Seiki Inc. Mist-spouting type drilling device. 5,004,382, Cl. 408-60.000.

Yoshinouchi, Atsushi; Itoh, Masataka; and Tsuchimoto, Shuhei, to Sharp Kabushiki Kaisha. Contact type image sensor with a fiber array coated in part with an absorber. 5,004,905, Cl. 250-208.100.

Yoshioka, Hiroshi: *See*—
Sato, Hiroshi; Hirose, Kenichi; Nagai, Koichi; Yoshioka, Hiroshi; and Nagaoka, Yoshihiko, 5,004,846, Cl. 568-940.000.

Yoshioka, Takeo; and Minagawa, Tadao, to Mitsubishi Denki K.K. Method for controlling gas in halogen gas laser and device therefor. 5,005,181, Cl. 372-59.000.

Young, Alfred; and Church, Fred E., to Design Tool, Inc. Fastener feeding and driving apparatus. 5,004,141, Cl. 227-112.000.

Young, Daniel E., to United Steel Products Co. Slope and skew hanger. 5,004,369, Cl. 403-232.100.

Young, Robert N.; Zamboni, Robert; and Gauthier, Jacques Y., to Merck Frosst Canada, Inc. Pyridyl styrene dialkanoic acids as anti-leukotriene agents. 5,004,743, Cl. 514-227.800.

Young, Rosa: *See*—
Ovshinsky, Stanford R.; and Young, Rosa, 5,004,725, Cl. 505-1.000.

Youngs, Janene. Self-adherent foam wrapping material. 5,004,642, Cl. 428-222.000.

Yu, Chyang J.: *See*—
Bardhan, Pronob; and Yu, Chyang J., 5,004,713, Cl. 501-134.000.

Yu Li Enterprise Co. Ltd.: *See*—
Weng, Kuo-Liang; and Weng, Kuo-Liang, 5,005,007, Cl. 340-650.000.

Yu, Meng W.; Su, Shihuai; Chen, Yue Z.; Zheng, Ticheng; Ji, Kebin; Ling, Shou R.; Lin, Jian C.; Deng, Jianhui; and Zhang, Kunwu, to PanZhiHua Iron & Steel Co. Process for manufacturing high strength railroad rails. 5,004,510, Cl. 148-146.000.

Yuhaku, Satoru: *See*—
Nakatani, Seiichi; Yuhaku, Satoru; Nishimura, Tsutomu; Terada, Yukio; and Baba, Yasuyuki, 5,004,640, Cl. 428-195.000.

Yuhasz, Stephen J., to Lutron Electronics Co., Inc. Wireless power control system with auxiliary local control. 5,005,211, Cl. 455-603.000.

Yukawa, Kimio: *See*—
Terai, Fumitaka; Yukawa, Kimio; Suyefuji, Mineo; Saito, Hiroki; and Yamaguchi, Shigeru, 5,004,628, Cl. 427-389.900.

Yula, Joseph J.: *See*—
Koblitz, Francis F.; O'Shea, Thomas M.; Stoner, Beverly A.; and Yula, Joseph J., 5,004,869, Cl. 174-84.00C.

Yum, Su I.: *See*—
Osborne, James L.; Nelson, Melinda; Enscore, David J.; Yum, Su I.; and Gale, Robert M., 5,004,610, Cl. 424-448.000.

Yuuhaku, Satoru: *See*—
Hakotani, Yasuhiko; Nakatani, Seiichi; Yuuhaku, Satoru; Nishimura, Tsutomu; and Ishida, Toru, 5,004,715, Cl. 501-136.000.

Yuzuriha, Yoshiki: *See*—
Iwamoto, Akio; and Yuzuriha, Yoshiki, 5,003,956, Cl. 123-494.000.

Zaghloul, Amir I.; and Sorbello, Robert M., to Communications Satellite Corporation. Electromagnetically coupled printed-circuit antennas having patches or slots capacitively coupled to feedlines. 5,005,019, Cl. 343-700.0MS.

Zahnradfabrik Friedrichshafen AG: *See*—
Petzold, Rainer; Fritz, Walter; and Wiencek, Norbert, 5,004,086, Cl. 192-85.00C.

Zambon S.p.A.: *See*—
Castaldi, Graziano; and Giordano, Claudio, 5,004,832, Cl. 562-490.000.

Zamboni, Robert: *See*—
Young, Robert N.; Zamboni, Robert; and Gauthier, Jacques Y., 5,004,743, Cl. 514-227.800.

Zanardi, Angelo; Mei, Daniele; and Toselli, Vittorio, to Sauer-Sundstrand S.p.A. Gear machine for use as a pump or motor. 5,004,412, Cl. 418-132.000.

Zdebel, Peter J.; and Vasquez, Barbara, to Motorola. Multiple trench semiconductor structure method. 5,004,703, Cl. 437-67.000.

Zdepski, Joel W.; and Koslov, Joshua L., to General Electric Company. Video signal compander adaptively responsive to predictions of the video signal processed. 5,005,082, Cl. 358-174.000.

Zebco Corporation: *See*—
Councilman, Richard R., 5,004,182, Cl. 242-232.000.

Zecher, Wilfried; El-Sayed, Aziz; Haese, Wilfried; Kohler, Burkhard; and Meyer, Rolf-Volker, to Bayer Aktiengesellschaft. Aliphatic-aromatic polyamide-imides. 5,004,795, Cl. 528-73.000.

Zelko, William E.: *See*—
McKee, Michael J.; Miknis, William D.; Pawlikowski, Joseph M.; and Zelko, William E., 5,004,887, Cl. 219-85.160.

Zellweger Telecommunications AG: *See*—
Kung, Roland; and Widmer, Hanspeter, 5,005,209, Cl. 455-32.000.

Zenbayashi, Michio: *See*—
Nagaoka, Hisayuki; Zenbayashi, Michio; and Shimizu, Chiyuki, 5,004,793, Cl. 528-15.000.

Zetachron, Inc.: *See*—
Snipes, Wallace C., 5,004,601, Cl. 424-78.000.

Zhang, Chong L.: *See*—
Broussard, Jerry A.; Auerbach, Andrew B.; Yang, Nan L.; Paul, James L.; Zheng, Yong C.; and Zhang, Chong L., 5,004,798, Cl. 528-230.000.

Zhang, Kunwu: *See*—
Yu, Meng W.; Su, Shihuai; Chen, Yue Z.; Zheng, Ticheng; Ji, Kebin; Ling, Shou R.; Lin, Jian C.; Deng, Jianhui; and Zhang, Kunwu, 5,004,510, Cl. 148-146.000.

Zheng, Ticheng: *See*—
Yu, Meng W.; Su, Shihuai; Chen, Yue Z.; Zheng, Ticheng; Ji, Kebin; Ling, Shou R.; Lin, Jian C.; Deng, Jianhui; and Zhang, Kunwu, 5,004,510, Cl. 148-146.000.

Zheng, Yong C.: *See*—
Broussard, Jerry A.; Auerbach, Andrew B.; Yang, Nan L.; Paul, James L.; Zheng, Yong C.; and Zhang, Chong L., 5,004,798, Cl. 528-230.000.

Ziegenfuss, James N., Jr. Floating lounge chair. 5,004,296, Cl. 297-194.000.

Zimmer: *See*—
Atkinson, Robert W., 5,004,468, Cl. 606-132.000.

Zlobinsky, Yury, to Savant Instruments. Cell preservation system. 5,003,787, Cl. 62-185.000.

Zocchi, Germaine: *See*—
Julemont, Michel; Zocchi, Germaine; Mineo, Nunzio; and Fonsny, Pierre, 5,004,556, Cl. 252-99.000.

Zodrow, Rudolf, to ETI-TEC Maschinenbau GmbH. Labelling machine for objects such as bottles or the like. 5,004,518, Cl. 156-568.000.

Zoller-Kipper GmbH: *See*—
Naab, Jakob, 5,004,392, Cl. 414-21.000.

Zweifel, Martin R. Method and plant for burning special waste. 5,003,893, Cl. 110-346.000.

Zweig, Andrew M.: *See*—
Harnish, Daniel F.; Pickens, Donald; and Zweig, Andrew M., 5,004,790, Cl. 526-242.000.

Zweigart, Gerhard: *See*—
Bauer, Theodor; and Zweigart, Gerhard, 5,004,291, Cl. 296-116.000.

Zyskind, John L.: *See*—
Desurvire, Emmanuel; Giles, Clinton R.; Simpson, Jay R.; and Zyskind, John L., 5,005,175, Cl. 372-6.000.

501 Heerema Engineering Service B.V.: *See*—
Van Ketel, Hendrik, 5,004,108, Cl. 212-255.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF APRIL, 1991

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Alcofuels, Inc.: *See—*
Badger, Stephen L., Re. 33,562, Cl. 44-438.000.

AMCA International Corporation: *See—*
Heckelsberg, Robert E., Re. 33,563, Cl. 52-404.000.

Badger, Stephen L., to Alcofuels, Inc. Fuel composition. Re. 33,562, Cl. 44-438.000.

Ballard Medical Products: *See—*
Ford, George W., Jr., Re. 33,564, Cl. 222-209.000.

Beck, Lee R.: *See—*
Stolle, Ralph J.; and Beck, Lee R., Re. 33,565, Cl. 424-87.000.

Ford, George W., Jr., to Ballard Medical Products. Foam dispensing device. Re. 33,564, Cl. 222-209.000.

Heckelsberg, Robert E., to AMCA International Corporation. Metal panel roofing structure. Re. 33,563, Cl. 52-404.000.

Stolle, Ralph J.; and Beck, Lee R., to Stolle Research and Development Corporation. Prevention and treatment of rheumatioid arthritis. Re. 33,565, Cl. 424-87.000.

Stolle Research and Development Corporation: *See—*
Stolle, Ralph J.; and Beck, Lee R., Re. 33,565, Cl. 424-87.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

a Porta, Reudi: *See—*
Bjerknes, Anders; and a Porta, Reudi, B1 4,198,094, Cl. 297-306.000.

Anchor Hocking Corp.: *See—*
Ochs, Charles S., B1 4,392,580, Cl. 215-332.000.

Bart, Philip D. Doll which rises from prone to standing position. B1 4,349,987, 4-2-91, Cl. 446-355.000.

Bjerknes, Anders; and a Porta, Reudi. Working chair. B1 4,198,094, 4-2-91, Cl. 297-306.000.

Cleveland Machine Controls, Inc.: *See—*
Griebeler, Elmer L., B1 4,459,526, Cl. 318-576.000.

Gall, John C., to Sears, Roebuck and Co. Material mixer. B1 4,235,553, 4-2-91, Cl. 366-208.000.

Griebeler, Elmer L., to Cleveland Machine Controls, Inc. Multi apertured lens shock wave probe. B1 4,459,526, 4-2-91, Cl. 318-576.000.

Houston, Reagan, to Salem Industries. Regenerative incinerator systems for waste gases. B1 3,870,474, 4-2-91, Cl. 422-171.000.

Ochs, Charles S., to Anchor Hocking Corp. Closure cap. B1 4,392,580, 4-2-91, Cl. 215-332.000.

Salem Industries: *See—*
Houston, Reagan, B1 3,870,474, Cl. 422-171.000.

Sears, Roebuck and Co.: *See—*
Gall, John C., B1 4,235,553, Cl. 366-208.000.

LIST OF DESIGN PATENTEES

Abe, Yoshinori: *See—*
Nishida, Mitsuhiro; Fujii, Kozaburo; Kondoh, Nobuyuki; and Abe, Yoshinori, 315,912, Cl. D15-7.000.

Abrams, Robert C.: *See—*
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,878, Cl. D11-164.000.
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,879, Cl. D11-164.000.
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,880, Cl. D11-164.000.

Altmann, Walter F.: *See—*
Tollefson, R. M.; Armstrong, Dane A.; LeMonds, David A.; Wakefield, Douglas J.; Altmann, Walter F.; and LaFond, Marcel L., 315,892, Cl. D12-315.000.

American Safety Flight Systems, Inc.: *See—*
Molzan, Albert R., 315,971, Cl. D29-6.000.

American Standard Inc.: *See—*
Enthoven, Axel, 315,844, Cl. D6-574.000.

Antonious, Anthony J. Iron golf club head. 315,939, 4-2-91, Cl. D21-220.000.

Armstrong, Dane A.: *See—*
Tollefson, R. M.; Armstrong, Dane A.; LeMonds, David A.; Wakefield, Douglas J.; Altmann, Walter F.; and LaFond, Marcel L., 315,892, Cl. D12-315.000.

Atlantic Richfield Company: *See—*
Frost, John S., 315,965, Cl. D26-67.000.

Avia Group International, Inc.: *See—*
Backus, Peter; and Feller, Craig, 315,824, Cl. D2-314.000.

Backus, Peter; and Feller, Craig, to Avia Group International, Inc. Shoe upper. 315,824, 4-2-91, Cl. D2-314.000.

Baker, Mac L'Dean, to Mobility Options Research Foundation. Vertical supporter for child or the like. 315,884, 4-2-91, Cl. D12-128.000.

Bally, Alexander: *See—*
Castel, John C.; and Bally, Alexander, 315,958, Cl. D24-41.000.

Beaudoin, Gaetan; and Cimon, Jacques, to Micro-Contact Inc. Automatic cattle feeder. 315,973, 4-2-91, Cl. D30-122.000.

Berggren, Ib H., to Interlego AG. Toy car. 315,931, 4-2-91, Cl. D21-128.000.

Berggren, Ib H., to Interlego AG. Toy car. 315,932, 4-2-91, Cl. D21-128.000.

Bergstrand, John W.: *See—*
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,878, Cl. D11-164.000.
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,879, Cl. D11-164.000.
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,880, Cl. D11-164.000.

Berland, Maxine L. Denture container. 315,954, 4-2-91, Cl. D24-10.000.

Berninger, Mark; and Schuette, Michael, to Life Technologies, Inc. Reaction tank for electrophoresis apparatus. 315,951, 4-2-91, Cl. D24-8.000.

Berninger, Mark; and Schuette, Michael, to Life Technologies, Inc. Horizontal gel electrophoresis unit. 315,952, 4-2-91, Cl. D24-8.000.

Bernon, Daniel J. Protective pad for a car seat. 315,837, 4-2-91, Cl. D6-368.000.

Best, James J.; and Sweeney, Margaret C., to International Business Machines Corporation. Portable file. 315,924, 4-2-91, Cl. D19-75.000.

Best, Jerina F. Coffin. 315,977, 4-2-91, Cl. D99-1.000.

Better Sleep Manufacturing Co.: *See—*
Emery, William W., 315,840, Cl. D6-525.000.

Bilangi, Dona. Handle grip for a baby bottle. 315,959, 4-2-91, Cl. D24-48.000.
Bixler, Cynthia C., to CinTom, Inc. Closure for a beverage can. 315,872, 4-2-91, Cl. D9-446.000.
Bobbitt, Earl W.: *See—*
Roope, Larry G.; and Bobbitt, Earl W., 315,841, Cl. D6-528.000.
Bolk, Phyllis J.: *See—*
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,878, Cl. D11-164.000.
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,879, Cl. D11-164.000.
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,880, Cl. D11-164.000.
Bomatic, Inc.: *See—*
Hestehave, Borge; and Hestehave, Kjeld, 315,867, Cl. D9-341.000.
Bostik, Inc.: *See—*
Nusse, Oktavio K.; and Krause, Wolf-Dieter, 315,852, Cl. D8-30.000.
Brace, Thomas J.: *See—*
Olson, Brennan J.; Brace, Thomas J.; and Frigard, Charles R., 315,941, Cl. D21-226.000.
Bransky, Jeffrey D.: *See—*
Perdue, Thomas E., Jr.; and Bransky, Jeffrey D., 315,870, Cl. D9-420.000.
Brazis, William E., to Rubbermaid Incorporated. Toilet bowl brush handle. 315,833, 4-2-91, Cl. D4-138.000.
Brown, Michael, to Northern Telecom Limited. Keypad. 315,896, 4-2-91, Cl. D14-100.000.
Brunner, Donald A. Tray for holding pepperoni slices. 315,849, 4-2-91, Cl. D7-672.000.
Bulgari, Paolo, to Partecipazione Bulgari S.p.A. Brooch. 315,875, 4-2-91, Cl. D11-43.000.
Burst, Hermann; and Kruschhausen, Heinz-Arno, to Dr. Ing. h.c.F. Porsch AG. Side view mirror. 315,889, 4-2-91, Cl. D12-187.000.
Bush, Thomas J. Bi-plane rocking toy. 315,929, 4-2-91, Cl. D21-68.000.
Cahill, Basil; and McCaffrey, Jack. Pool rack triangle. 315,942, 4-2-91, Cl. D21-232.000.
Campbell, Jack F., to GSW Inc. Pump housing. 315,911, 4-2-91, Cl. D15-7.000.
Caroma Industries Limited: *See—*
Thompson, Bruce R., 315,948, Cl. D23-313.000.
Carroll, Francis G. Bracket. 315,859, 4-2-91, Cl. D8-357.000.
Casablanca Fan Company, Inc.: *See—*
Hollbrook, Richard M., 315,946, Cl. D23-377.000.
Hollbrook, Richard M., 315,947, Cl. D23-377.000.
Castel, John C.; and Bally, Alexander, to Physio Technology, Inc. Physiological stimulator. 315,958, 4-2-91, Cl. D24-41.000.
Channell, William H. All-weather covering for cable television equipment. 315,906, 4-2-91, Cl. D14-239.000.
Chen, Jen F. Yarn feeder. 315,914, 4-2-91, Cl. D15-72.000.
Cheng, Thomas. Telephone set with transparent outer surface and neon-light tube surrounding the base. 315,904, 4-2-91, Cl. D14-150.000.
Cheng, Willis, to Woods Far East, Inc. Heavy duty, remotely controlled timer switch. 315,893, 4-2-91, Cl. D13-165.000.
Cimon, Jacques: *See—*
Beaudoin, Gaetan; and Cimon, Jacques, 315,973, Cl. D30-122.000.
CinTom, Inc.: *See—*
Bixler, Cynthia C., 315,872, Cl. D9-446.000.
Clark, Larry M.; and Magdaleno, Janell E., to L.A. Gear, Inc. Element of a shoe upper. 315,828, 4-2-91, Cl. D2-314.000.
Claytor, Richard N.; and Torti, Russell G., to Fresnel Technologies, Inc. Wide angle fresnel lens array for infrared motion detector system. 315,966, 4-2-91, Cl. D26-122.000.
Collette, Wayne N., to Continental PET Technologies, Inc. Container body for liquids or the like. 315,869, 4-2-91, Cl. D9-392.000.
Collins, Frederick E.: *See—*
Wilson, Jerry L.; Schneider, Jon; and Collins, Frederick E., 315,934, Cl. D21-191.000.
Wilson, Jerry L.; Schneider, Jon; and Collins, Frederick E., 315,935, Cl. D21-191.000.
Wilson, Jerry L.; Schneider, Jon; and Collins, Frederick E., 315,936, Cl. D21-191.000.
Conair Corporation: *See—*
Rizzuto, Leandro P.; Lindsey, Frank; and Leung, Anthony, 315,967, Cl. D28-35.000.
Rizzuto, Leandro P.; Lindsey, Frank; and Leung, Anthony, 315,968, Cl. D28-35.000.
Continental PET Technologies, Inc.: *See—*
Collette, Wayne N., 315,869, Cl. D9-392.000.
Covington, Melvin R. Water purifying canteen. 315,829, 4-2-91, Cl. D3-30.100.
Craig, Franklin J.: *See—*
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,878, Cl. D11-164.000.
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,879, Cl. D11-164.000.
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,880, Cl. D11-164.000.
Dahlquist, Cindy K. Magnetized frame for holding plural photographs. 315,835, 4-2-91, Cl. D6-302.000.
DeCaro, Jack A. Combined flashing lights & traffic cone. 315,874, 4-2-91, Cl. D10-114.000.
Digital Equipment Corporation: *See—*
Faranda, Robert T.; and Kim, Steven D., 315,897, Cl. D14-100.000.
Dixon, Michael, to Samrein Pty Ltd. Bicycle holder for attachment to a vehicle roof rack. 315,888, 4-2-91, Cl. D12-157.000.
Dr. Ing. h.c.F. Porsch AG: *See—*
Burst, Hermann; and Kruschhausen, Heinz-Arno, 315,889, Cl. D12-187.000.
Donnelly, Wilma M.: *See—*
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,878, Cl. D11-164.000.
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,879, Cl. D11-164.000.
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,880, Cl. D11-164.000.
Down, Paul, to Kemberly, Inc. Exterior vehicle visor or similar article. 315,891, 4-2-91, Cl. D12-191.000.
Doyle, Sondra K. Combined basketball game goal and ball return. 315,938, 4-2-91, Cl. D21-201.000.
Dragan, William B. Dental syringe tip. 315,956, 4-2-91, Cl. D24-14.000.
Eastman Kodak Compay: *See—*
Leonard, Bruce A.; and Pelcher, Deborah N., 315,916, Cl. D16-218.000.
Elleance Ltd.: *See—*
McCready, Karen E., 315,969, Cl. D28-85.000.
Ellison, E. Todd. Guitar body. 315,917, 4-2-91, Cl. D17-20.000.
Ellison, E. Todd. Removable cartridge for guitar body. 315,918, 4-2-91, Cl. D17-20.000.
Embree, Donald; and Mathey, Stanley A., to Rubbermaid Incorporated. Clip hook for perforate supports. 315,864, 4-2-91, Cl. D8-395.000.
Emery, William W., to Better Sleep Manufacturing Co. Shower caddy. 315,840, 4-2-91, Cl. D6-525.000.
Enthoven, Axel, to American Standard Inc. Wall-mounted shelf or the like. 315,844, 4-2-91, Cl. D6-574.000.
Erwin, Eldin H. Multiple unit vending machine. 315,927, 4-2-91, Cl. D20-4.000.
Faranda, Robert T.; and Kim, Steven D., to Digital Equipment Corporation. Keyboard. 315,897, 4-2-91, Cl. D14-100.000.
Farr, Richard H.: *See—*
Gelardi, Paul J.; Gelardi, Anthony L.; Lowry, Alan B.; Lovecky, Craig S.; and Farr, Richard H., 315,868, Cl. D9-341.000.
Feller, Craig: *See—*
Backus, Peter; and Feller, Craig, 315,824, Cl. D2-314.000.
Fellowes Mfg. Co.: *See—*
Rich, Beverly C., 315,925, Cl. D19-92.000.
Rich, Beverly C., 315,926, Cl. D19-92.000.
Ferrero Ardennes S.A.: *See—*
Ferrero, Pietro, 315,866, Cl. D9-318.000.
Ferrero, Pietro, to Ferrero Ardennes S.A. Container for confectionery products. 315,866, 4-2-91, Cl. D9-318.000.
Fisscher, Brahm, to Pawly Industries Corporation. Boat cover clip. 315,865, 4-2-91, Cl. D8-395.000.
Flieder, Robert A. Solar powered illuminated yard marker. 315,928, 4-2-91, Cl. D20-17.000.
Forman, Bruce J. Snorkel. 315,972, 4-2-91, Cl. D29-7.000.
Fraker, Richard: *See—*
Joss, Michael S.; Gresens, Stanley P.; and Fraker, Richard, 315,860, Cl. D8-367.000.
France, John: *See—*
Rocheleau, George A.; Graves, Michael C.; and France, John, 315,832, Cl. D13-179.000.
Frattini, Gianfranco. Door handle. 315,857, 4-2-91, Cl. D8-308.000.
Frattini, Gianfranco. Door handle. 315,858, 4-2-91, Cl. D8-308.000.
Fresnel Technologies, Inc.: *See—*
Claytor, Richard N.; and Torti, Russell G., 315,966, Cl. D26-122.000.
Frigard, Charles R.: *See—*
Olson, Brennan J.; Brace, Thomas J.; and Frigard, Charles R., 315,941, Cl. D21-226.000.
Frischer, Ivar. Hand tool holder. 315,923, 4-2-91, Cl. D19-55.000.
Frost, John S., to Atlantic Richfield Company. Solar powered walkway light. 315,965, 4-2-91, Cl. D26-67.000.
Fujii, Kozaburo: *See—*
Nishida, Mitsuhiro; Fujii, Kozaburo; Kondoh, Nobuyuki; and Abe, Yoshinori, 315,912, Cl. D15-7.000.
Fujimoto, Munerori: *See—*
Hokura, Yoshikazu; Koda, Hironosuke; and Fujimoto, Munerori, 315,898, Cl. D14-107.000.
Fumia, Enrico, to Pininfarina Extra S.r.l. Accessory container for a golf bag. 315,826, 4-2-91, Cl. D3-37.000.
Fushiya, Fusao; and Yamauchi, Shigeki, to Makita Electric Works, Ltd. Portable electric wrench. 315,855, 4-2-91, Cl. D8-68.000.
Gajeton, Wilhelm: *See—*
Ramos, Aniano D.; and Gajeton, Wilhelm, 315,970, Cl. D29-2.000.
Gelardi, Anthony L.: *See—*
Gelardi, Paul J.; Gelardi, Anthony L.; Lowry, Alan B.; Lovecky, Craig S.; and Farr, Richard H., 315,868, Cl. D9-341.000.
Gelardi, Paul J.; Gelardi, Anthony L.; Lowry, Alan B.; Lovecky, Craig S.; and Farr, Richard H., to Shape Inc. Combination display package

and flip file holder for compact disc boxes. 315,868, 4-2-91, Cl. D9-341.000.
Gentilli, Bruno, to S. T. Dupont. Scarf. 315,834, 4-2-91, Cl. D5-16.000.
Giannini, Gabriel M. Underwater switch. 315,894, 4-2-91, Cl. D13-171.000.
Gibich, Gary J. Fishing rod or the like. 315,944, 4-2-91, Cl. D22-142.000.
Giordano, John M., to Hunt Holdings, Inc. Paper sheet. 315,922, 4-2-91, Cl. D19-1.000.
Gold Star Co., Ltd.: *See*—
Kim, Yong H., 315,899, Cl. D14-109.000.
Graves, Michael C.: *See*—
Rocheleau, George A.; Graves, Michael C.; and France, John, 315,832, Cl. D13-179.000.
Greencare PTY. Limited: *See*—
Livingstone, David J., 315,913, Cl. D15-28.000.
Greer, Richard B. Adjustable desk lamp. 315,963, 4-2-91, Cl. D26-63.000.
Gresens, Stanley P.: *See*—
Joss, Michael S.; Gresens, Stanley P.; and Fraker, Richard, 315,860, Cl. D8-367.000.
GSW Inc.: *See*—
Campbell, Jack F., 315,911, Cl. D15-7.000.
GTE Products Corporation: *See*—
Kackenmeister, Carl F.; and Kling, Michael R., 315,961, Cl. D26-2.000.
Guzman, Arthur G. Insulative cover for paper beverage cups. 315,848, 4-2-91, Cl. D7-608.000.
Hasegawa, Shigeru: *See*—
Ito, Masafumi; Hasegawa, Shigeru; Takita, Haruki; and Sube, Minoru, 315,905, Cl. D14-156.000.
Hassel, H. Charles; and Westland, Donald, to MicroComputer Accessories, Inc. Multi-form feeder for printer. 315,921, 4-2-91, Cl. D18-22.000.
Hatzenbeller, Garold E. Combined hot pit and grill. 315,846, 4-2-91, Cl. D7-335.000.
Hedges, Kelley M. Multi-tier planter unit. 315,877, 4-2-91, Cl. D11-143.000.
Heidmann, Charles, to Steelcase Strafor. Glazed extension panel. 315,960, 4-2-91, Cl. D25-138.000.
Heller, Steve C., to Illinois Tool Works Inc. Tent pole tip. 315,943, 4-2-91, Cl. D21-254.000.
Hermann, Klaus-Dieter. Manually operated labelling gun. 315,920, 4-2-91, Cl. D18-19.000.
Hestair Kiddicraft Limited: *See*—
Thomson, Harry S.; Raffo, David M.; and Pape, John A., 315,930, Cl. D21-123.000.
Hestehave, Borge; and Hestehave, Kjeld, to Bomatic, Inc. Dual compartment bottle. 315,867, 4-2-91, Cl. D9-341.000.
Hestehave, Kjeld: *See*—
Hestehave, Borge; and Hestehave, Kjeld, 315,867, Cl. D9-341.000.
Highland Supply Corporation: *See*—
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,878, Cl. D11-164.000.
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,879, Cl. D11-164.000.
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,880, Cl. D11-164.000.
Weder, Donald E., 315,881, Cl. D11-164.000.
Weder, Donald E., 315,882, Cl. D11-164.000.
Weder, Donald E., 315,883, Cl. D11-164.000.
Hokura, Yoshikazu; Koda, Hironosuke; and Fujimoto, Munerori, to Matsushita Graphic Communication Systems, Inc. Page scanner. 315,898, 4-2-91, Cl. D14-107.000.
Hollbrook, Richard M., to Casablanca Fan Company, Inc. Ceiling fan and light fixture. 315,946, 4-2-91, Cl. D23-377.000.
Hollbrook, Richard M., to Casablanca Fan Company, Inc. Ceiling fan. 315,947, 4-2-91, Cl. D23-377.000.
Horn, Jerold S.: *See*—
Kelly, John S.; Horn, Jerold S.; and Pospisil, Jirina V., 315,957, Cl. D24-16.000.
Hoshino, Kiyoshi: *See*—
Kawakami, Hideki; and Hoshino, Kiyoshi, 315,854, Cl. D8-66.000.
Huang, Chii M. Combined brush head and scraper. 315,975, 4-2-91, Cl. D32-41.000.
Huggins, Jack D.; and Pannell, John. Physical exerciser. 315,937, 4-2-91, Cl. D21-191.000.
Hunt Holdings, Inc.: *See*—
Giordano, John M., 315,922, Cl. D19-1.000.
Hutton, Anthony; Straughan, Phillip A.; Norwood, Tiffany A.; and Pfeffer, Oliver, to ToPAQ, Inc. Backpack. 315,825, 4-2-91, Cl. D3-32.000.
Iijima, Goro: *See*—
Miyamoto, Akira; Ohmiya, Tokushige; Otani, Genichiro; Kawai, Setsuo; Watanabe, Kenji; Iijima, Goro; Matsubara, Takeshi; and Kameda, Takanobu, 315,919, Cl. D18-13.000.
Illinois Tool Works Inc.: *See*—
Heller, Steve C., 315,943, Cl. D21-254.000.
Interlego AG: *See*—
Berggren, Ib H., 315,931, Cl. D21-128.000.
Berggren, Ib H., 315,932, Cl. D21-128.000.
International Business Machines Corporation: *See*—
Best, James J.; and Sweeney, Margaret C., 315,924, Cl. D19-75.000.
Ito, Masafumi; Hasegawa, Shigeru; Takita, Haruki; and Sube, Minoru, to Teac Corporation. Digital audio disc player. 315,905, 4-2-91, Cl. D14-156.000.
Iwata, Hirokimi, to Sony Corporation. Optical disc cartridge. 315,900, 4-2-91, Cl. D14-114.000.
Jacobs, Richard H., to Tri Industries, Inc. Infant stroller. 315,885, 4-2-91, Cl. D12-129.000.
Joosten, Stefanus F.; and Krol, Leonardus A., to U.S. Philips Corporation. Spotlight housing. 315,964, 4-2-91, Cl. D26-63.000.
Joss, Michael S.; Gresens, Stanley P.; and Fraker, Richard. Double hook. 315,860, 4-2-91, Cl. D8-367.000.
Kackenmeister, Carl F.; and Kling, Michael R., to GTE Products Corporation. Reflector lamp. 315,961, 4-2-91, Cl. D26-2.000.
Kaiser, Kenneth L. Chair. 315,836, 4-2-91, Cl. D6-334.000.
Kameda, Takanobu: *See*—
Miyamoto, Akira; Ohmiya, Tokushige; Otani, Genichiro; Kawai, Setsuo; Watanabe, Kenji; Iijima, Goro; Matsubara, Takeshi; and Kameda, Takanobu, 315,919, Cl. D18-13.000.
Kawai, Setsuo: *See*—
Miyamoto, Akira; Ohmiya, Tokushige; Otani, Genichiro; Kawai, Setsuo; Watanabe, Kenji; Iijima, Goro; Matsubara, Takeshi; and Kameda, Takanobu, 315,919, Cl. D18-13.000.
Kawakami, Hideki; and Hoshino, Kiyoshi, to Ryobi Ltd. Electric saw. 315,854, 4-2-91, Cl. D8-66.000.
Kawano, Yusuke, to Pigeon Co., Ltd. Toothbrush. 315,831, 4-2-91, Cl. D4-104.000.
Kelly, John S.; Horn, Jerold S.; and Pospisil, Jirina V., to Minnesota Mining and Manufacturing Company. Orthodontic bracket. 315,957, 4-2-91, Cl. D24-16.000.
Kemberly, Inc.: *See*—
Down, Paul, 315,891, Cl. D12-191.000.
Kim, Steven D.: *See*—
Faranda, Robert T.; and Kim, Steven D., 315,897, Cl. D14-100.000.
Kim, Yong H., to Gold Star Co., Ltd. Floppy disk drive unit. 315,899, 4-2-91, Cl. D14-109.000.
King Jim Co., Ltd.: *See*—
Miyamoto, Akira; Ohmiya, Tokushige; Otani, Genichiro; Kawai, Setsuo; Watanabe, Kenji; Iijima, Goro; Matsubara, Takeshi; and Kameda, Takanobu, 315,919, Cl. D18-13.000.
King, William L., to Samsonite Corporation. Soft luggage case. 315,827, 4-2-91, Cl. D3-71.000.
Kling, Michael R.: *See*—
Kackenmeister, Carl F.; and Kling, Michael R., 315,961, Cl. D26-2.000.
Knowles, Carl H., to Metrologic Instruments, Inc. Portable laser scanner. 315,901, 4-2-91, Cl. D14-116.000.
Koda, Hironosuke: *See*—
Hokura, Yoshikazu; Koda, Hironosuke; and Fujimoto, Munerori, 315,898, Cl. D14-107.000.
Kondoh, Nobuyuki: *See*—
Nishida, Mitsuhiro; Fujii, Kozaburo; Kondoh, Nobuyuki; and Abe, Yoshinori, 315,912, Cl. D15-7.000.
Krause, Wolf-Dieter: *See*—
Nusse, Oktavio K.; and Krause, Wolf-Dieter, 315,852, Cl. D8-30.000.
Krol, Leonardus A.: *See*—
Joosten, Stefanus F.; and Krol, Leonardus A., 315,964, Cl. D26-63.000.
Kruschhausen, Heinz-Arno: *See*—
Burst, Hermann; and Kruschhausen, Heinz-Arno, 315,889, Cl. D12-187.000.
L.A. Gear, Inc.: *See*—
Clark, Larry M.; and Magdaleno, Janell E., 315,828, Cl. D2-314.000.
Lafley, Linda S. Nursing pillow. 315,845, 4-2-91, Cl. D6-601.000.
LaFond, Marcel L.: *See*—
Tollefson, R. M.; Armstrong, Dane A.; LeMonds, David A.; Wakefield, Douglas J.; Altmann, Walter F.; and LaFond, Marcel L., 315,892, Cl. D12-315.000.
Lavinsky, Joshua F.; and Payne, Thomas M., to Lavinsky, Joshua F. Portable light projector for producing multicolored line patterns on a wall or the like in response to an audio input signal. 315,962, 4-2-91, Cl. D26-24.000.
Laws, Adam T., to McLaughlin, James Gregory. Rolling ruler. 315,873, 4-2-91, Cl. D10-62.000.
LeMonds, David A.: *See*—
Tollefson, R. M.; Armstrong, Dane A.; LeMonds, David A.; Wakefield, Douglas J.; Altmann, Walter F.; and LaFond, Marcel L., 315,892, Cl. D12-315.000.
Leonard, Bruce A.; and Pelcher, Deborah N., to Eastman Kodak Compay. Still camera. 315,916, 4-2-91, Cl. D16-218.000.
Leung, Anthony: *See*—
Rizzuto, Leandro P.; Lindsey, Frank; and Leung, Anthony, 315,967, Cl. D28-35.000.
Rizzuto, Leandro P.; Lindsey, Frank; and Leung, Anthony, 315,968, Cl. D28-35.000.
Lewo, Joe. Combined vehicle sun visor and cellular telephone unit. 315,890, 4-2-91, Cl. D12-191.000.
Life Technologies, Inc.: *See*—
Berninger, Mark; and Schuette, Michael, 315,951, Cl. D24-8.000.
Berninger, Mark; and Schuette, Michael, 315,952, Cl. D24-8.000.
Lindeman, Phillip E.: *See*—
Wong, Allen; Soren, Leonid; and Lindeman, Phillip E., 315,907, Cl. D14-247.000.

Lindsey, Frank: *See—*
Rizzuto, Leandro P.; Lindsey, Frank; and Leung, Anthony, 315,967, Cl. D28-35.000.
Rizzuto, Leandro P.; Lindsey, Frank; and Leung, Anthony, 315,968, Cl. D28-35.000.
Livingstone, David J., to Greencare PTY. Limited. Knife holder for turf aeration machine. 315,913, 4-2-91, Cl. D15-28.000.
Lovecky, Craig S.: *See—*
Gelardi, Paul J.; Gelardi, Anthony L.; Lowry, Alan B.; Lovecky, Craig S.; and Farr, Richard H., 315,868, Cl. D9-341.000.
Lowry, Alan B.: *See—*
Gelardi, Paul J.; Gelardi, Anthony L.; Lowry, Alan B.; Lovecky, Craig S.; and Farr, Richard H., 315,868, Cl. D9-341.000.
Lundy, John C., to Vaporflow Technology, Inc. Anesthesia vaporizer unit. 315,950, 4-2-91, Cl. D24-8.000.
M.Y. Sports & Games Ltd.: *See—*
Whitebread, David, 315,871, Cl. D9-415.000.
MacLeod, Alan: *See—*
Zaborowski, Thaddeus; and MacLeod, Alan, 315,853, Cl. D8-30.000.
Magdaleno, Janell E.: *See—*
Clark, Larry M.; and Magdaleno, Janell E., 315,828, Cl. D2-314.000.
Makita Electric Works, Ltd.: *See—*
Fushiya, Fusao; and Yamauchi, Shigeki, 315,855, Cl. D8-68.000.
Mann, Lloyd J. Dental impression tray for small animals. 315,955, 4-2-91, Cl. D24-10.000.
Martorella, Ellen. Jewelry, trinket and accessory organizer. 315,839, 4-2-91, Cl. D6-513.000.
Mathey, Stanley A.: *See—*
Embree, Donald; and Mathey, Stanley A., 315,864, Cl. D8-395.000.
Matsubara, Takeshi: *See—*
Miyamoto, Akira; Ohmiya, Tokushige; Otani, Genichiro; Kawai, Setsuo; Watanabe, Kenji; Iijima, Goro; Matsubara, Takeshi; and Kameda, Takanobu, 315,919, Cl. D18-13.000.
Matsushita Graphic Communication Systems, Inc.: *See—*
Hokura, Yoshikazu; Koda, Hironosuke; and Fujimoto, Munerori, 315,898, Cl. D14-107.000.
McCaffrey, Jack: *See—*
Cahill, Basil; and McCaffrey, Jack, 315,942, Cl. D21-232.000.
McCready, Karen E., to Elleance Ltd. Lipstick case. 315,969, 4-2-91, Cl. D28-85.000.
McLaughlin, James Gregory: *See—*
Laws, Adam T., 315,873, Cl. D10-62.000.
Metrologic Instruments, Inc.: *See—*
Knowles, Carl H., 315,901, Cl. D14-116.000.
Micro-Contact Inc.: *See—*
Beaudoin, Gaetan; and Cimon, Jacques, 315,973, Cl. D30-122.000.
MicroComputer Accessories, Inc.: *See—*
Hassel, H. Charles; and Westland, Donald, 315,921, Cl. D18-22.000.
Minnesota Mining and Manufacturing Company: *See—*
Kelly, John S.; Horn, Jerold S.; and Pospisil, Jirina V., 315,957, Cl. D24-16.000.
Mitsubishi Denki K.K.: *See—*
Nishida, Mitsuhiro; Fujii, Kozaburo; Kondoh, Nobuyuki; and Abe, Yoshinori, 315,912, Cl. D15-7.000.
Miyamoto, Akira; Ohmiya, Tokushige; Otani, Genichiro; Kawai, Setsuo; Watanabe, Kenji; Iijima, Goro; Matsubara, Takeshi; and Kameda, Takanobu, to King Jim Co., Ltd. Electronic tape writer. 315,919, 4-2-91, Cl. D18-13.000.
Mobility Options Research Foundation: *See—*
Baker, Mac L'Dean, 315,884, Cl. D12-128.000.
Molzan, Albert R., to American Safety Flight Systems, Inc. Pressure reducer unit for emergency breathing systems. 315,971, 4-2-91, Cl. D29-6.000.
Moran, Ellen M.; and Moran, James M., to Moran, Ellen M. Wireform for an orthodontic appliance or similar article. 315,953, 4-2-91, Cl. D24-16.000.
Moran, James M.: *See—*
Moran, Ellen M.; and Moran, James M., 315,953, Cl. D24-16.000.
Morimiya, Yuji, to Sony Corporation. Video camera combined with video tape recorder. 315,915, 4-2-91, Cl. D16-202.000.
Motorola Inc.: *See—*
Wong, Allen; Soren, Leonid; and Lindeman, Phillip E., 315,907, Cl. D14-247.000.
Nakauma, Yoshiaki, to Namco, Ltd. Game cartridge. 315,902, 4-2-91, Cl. D14-121.000.
Nakauma, Yoshiaki, to Namco, Ltd. Game cartridge. 315,903, 4-2-91, Cl. D14-121.000.
Namco, Ltd.: *See—*
Nakauma, Yoshiaki, 315,902, Cl. D14-121.000.
Nakauma, Yoshiaki, 315,903, Cl. D14-121.000.
Nishida, Mitsuhiro; Fujii, Kozaburo; Kondoh, Nobuyuki; and Abe, Yoshinori, to Mitsubishi Denki K.K. Vacuum pump. 315,912, 4-2-91, Cl. D15-7.000.
Northern Telecom Limited: *See—*
Brown, Michael, 315,896, Cl. D14-100.000.
Norwood, Tiffany A.: *See—*
Hutton, Anthony; Straughan, Phillip A.; Norwood, Tiffany A.; and Pfeffer, Oliver, 315,825, Cl. D3-32.000.
Nusse, Oktavio K.; and Krause, Wolf-Dieter, to Bostik, Inc. Hot melt dispenser. 315,852, 4-2-91, Cl. D8-30.000.
Ohmiya, Tokushige: *See—*
Miyamoto, Akira; Ohmiya, Tokushige; Otani, Genichiro; Kawai, Setsuo; Watanabe, Kenji; Iijima, Goro; Matsubara, Takeshi; and Kameda, Takanobu, 315,919, Cl. D18-13.000.
Ohtsu Tire & Rubber Co., Ltd., The: *See—*
Shintomi, Hisashi, 315,887, Cl. D12-136.000.
Olson, Brennan J.; Brace, Thomas J.; and Frigard, Charles R., to Rollerblade, Inc. Roller skate brake. 315,941, 4-2-91, Cl. D21-226.000.
Otani, Genichiro: *See—*
Miyamoto, Akira; Ohmiya, Tokushige; Otani, Genichiro; Kawai, Setsuo; Watanabe, Kenji; Iijima, Goro; Matsubara, Takeshi; and Kameda, Takanobu, 315,919, Cl. D18-13.000.
Paine, Stephen H.; and Schofield, Carl, to Syco Systems Ltd. Console for data input/output tablet. 315,895, 4-2-91, Cl. D14-100.000.
Pannell, John: *See—*
Huggins, Jack D.; and Pannell, John, 315,937, Cl. D21-191.000.
Pape, John A.: *See—*
Thomson, Harry S.; Raffo, David M.; and Pape, John A., 315,930, Cl. D21-123.000.
Partecipazione Bulgari S.p.A.: *See—*
Bulgari, Paolo, 315,875, Cl. D11-43.000.
Pawly Industries Corporation: *See—*
Fisscher, Brahm, 315,865, Cl. D8-395.000.
Payne, Thomas M.: *See—*
Lavinsky, Joshua F.; and Payne, Thomas M., 315,962, Cl. D26-24.000.
Pelcher, Deborah N.: *See—*
Leonard, Bruce A.; and Pelcher, Deborah N., 315,916, Cl. D16-218.000.
Penrod, Robert R. Inflatable crib. 315,838, 4-2-91, Cl. D6-391.000.
Perdue, Thomas E., Jr.; and Bransky, Jeffrey D. Storage box with hinged lid. 315,870, 4-2-91, Cl. D9-420.000.
Pfeffer, Oliver: *See—*
Hutton, Anthony; Straughan, Phillip A.; Norwood, Tiffany A.; and Pfeffer, Oliver, 315,825, Cl. D3-32.000.
Physio Technology, Inc.: *See—*
Castel, John C.; and Bally, Alexander, 315,958, Cl. D24-41.000.
Pigeon Co., Ltd.: *See—*
Kawano, Yusuke, 315,831, Cl. D4-104.000.
Pininfarina Extra S.r.l.: *See—*
Fumia, Enrico, 315,826, Cl. D3-37.000.
Pospisil, Jirina V.: *See—*
Kelly, John S.; Horn, Jerold S.; and Pospisil, Jirina V., 315,957, Cl. D24-16.000.
Quaker Oats Company, The: *See—*
Wehmeyer, Stephen D., 315,940, Cl. D21-226.000.
Raffo, David M.: *See—*
Thomson, Harry S.; Raffo, David M.; and Pape, John A., 315,930, Cl. D21-123.000.
Ramos, Aniano D.; and Gajeton, Wilhelm. Fire extinguisher. 315,970, 4-2-91, Cl. D29-2.000.
Rich, Beverly C., to Fellowes Mfg. Co. Letter tray. 315,925, 4-2-91, Cl. D19-92.000.
Rich, Beverly C., to Fellowes Mfg. Co. Holder for a note pad or similar article. 315,926, 4-2-91, Cl. D19-92.000.
Rizzuto, Leandro P.; Lindsey, Frank; and Leung, Anthony, to Conair Corporation. Hair crimping head appliance. 315,967, 4-2-91, Cl. D28-35.000.
Rizzuto, Leandro P.; Lindsey, Frank; and Leung, Anthony, to Conair Corporation. Hair crimping head appliance. 315,968, 4-2-91, Cl. D28-35.000.
Roberts, Ellen. Lighted handbag. 315,830, 4-2-91, Cl. D3-52.000.
Rocheleau, George A.; Graves, Michael C.; and France, John, to Rockford Corporation. Heat sink. 315,832, 4-2-91, Cl. D13-179.000.
Rockford Corporation: *See—*
Rocheleau, George A.; Graves, Michael C.; and France, John, 315,832, Cl. D13-179.000.
Rollerblade, Inc.: *See—*
Olson, Brennan J.; Brace, Thomas J.; and Frigard, Charles R., 315,941, Cl. D21-226.000.
Roope, Larry G.; and Bobbitt, Earl W. Combined toothbrush holder and protector. 315,841, 4-2-91, Cl. D6-528.000.
Rubbermaid Incorporated: *See—*
Brazis, William E., 315,833, Cl. D4-138.000.
Embree, Donald; and Mathey, Stanley A., 315,864, Cl. D8-395.000.
Ryobi Ltd.: *See—*
Kawakami, Hideki; and Hoshino, Kiyoshi, 315,854, Cl. D8-66.000.
S. T. Dupont: *See—*
Gentilli, Bruno, 315,834, Cl. D5-16.000.
Sachs, Isaac. Support strap bracket. 315,861, 4-2-91, Cl. D8-371.000.
Samrein Pty Ltd.: *See—*
Dixon, Michael, 315,888, Cl. D12-157.000.
Samsonite Corporation: *See—*
King, William L., 315,827, Cl. D3-71.000.
Schawbel Corporation, The: *See—*
Zaborowski, Thaddeus; and MacLeod, Alan, 315,853, Cl. D8-30.000.
Schneider, Jon: *See—*
Wilson, Jerry L.; Schneider, Jon; and Collins, Frederick E., 315,934, Cl. D21-191.000.
Wilson, Jerry L.; Schneider, Jon; and Collins, Frederick E., 315,935, Cl. D21-191.000.
Wilson, Jerry L.; Schneider, Jon; and Collins, Frederick E., 315,936, Cl. D21-191.000.
Schofield, Carl: *See—*
Paine, Stephen H.; and Schofield, Carl, 315,895, Cl. D14-100.000.
Schuette, Michael: *See—*
Berninger, Mark; and Schuette, Michael, 315,951, Cl. D24-8.000.
Berninger, Mark; and Schuette, Michael, 315,952, Cl. D24-8.000.

SEB: *See*—
Sebillotte, Christian, 315,847, Cl. D7-393.000.
Sebillotte, Christian, to SEB. Handle for a pressure cooker. 315,847, 4-2-91, Cl. D7-393.000.
Sello, Bengt, to Soft Construction AB. Ventilator. 315,949, 4-2-91, Cl. D23-393.000.
Shape Inc.: *See*—
Gelardi, Paul J.; Gelardi, Anthony L.; Lowry, Alan B.; Lovecky, Craig S.; and Farr, Richard H., 315,868, Cl. D9-341.000.
Shieh, Y. S. Manual winch device. 315,976, 4-2-91, Cl. D34-33.000.
Shintomi, Hisashi, to Ohtsu Tire & Rubber Co., Ltd., The. Vehicle tire. 315,887, 4-2-91, Cl. D12-136.000.
Shui-Mu, Lee. Pipe holder. 315,863, 4-2-91, Cl. D8-380.000.
Sidi Sport S.a.s. di Dino Signori & C.: *See*—
Signori, Dino, 315,823, Cl. D2-274.000.
Signori, Dino, to Sidi Sport S.a.s. di Dino Signori & C. Cross-country motorcyclist's boot. 315,823, 4-2-91, Cl. D2-274.000.
Soft Construction AB: *See*—
Sello, Bengt, 315,949, Cl. D23-393.000.
Sony Corporation: *See*—
Iwata, Hirokimi, 315,900, Cl. D14-114.000.
Morimiya, Yuji, 315,915, Cl. D16-202.000.
Soren, Leonid: *See*—
Wong, Allen; Soren, Leonid; and Lindeman, Phillip E., 315,907, Cl. D14-247.000.
Specker, Lewis, Jr. Closet pole hanger. 315,862, 4-2-91, Cl. D8-380.000.
Steelcase Strafor: *See*—
Heidmann, Charles, 315,960, Cl. D25-138.000.
Steiner, Gerald. Animal feeding table. 315,974, 4-2-91, Cl. D30-131.000.
Straughan, Phillip A.: *See*—
Hutton, Anthony; Straughan, Phillip A.; Norwood, Tiffany A.; and Pfeffer, Oliver, 315,825, Cl. D3-32.000.
Sube, Minoru: *See*—
Ito, Masafumi; Hasegawa, Shigeru; Takita, Haruki; and Sube, Minoru, 315,905, Cl. D14-156.000.
Sung, Rak M. Hula doll. 315,933, 4-2-91, Cl. D21-180.000.
Sweeney, Margaret C.: *See*—
Best, James J.; and Sweeney, Margaret C., 315,924, Cl. D19-75.000.
Syco Systems Ltd.: *See*—
Paine, Stephen H.; and Schofield, Carl, 315,895, Cl. D14-100.000.
Takita, Haruki: *See*—
Ito, Masafumi; Hasegawa, Shigeru; Takita, Haruki; and Sube, Minoru, 315,905, Cl. D14-156.000.
Tallman, Larry E. Toothpaste dispenser. 315,842, 4-2-91, Cl. D6-541.000.
Teac Corporation: *See*—
Ito, Masafumi; Hasegawa, Shigeru; Takita, Haruki; and Sube, Minoru, 315,905, Cl. D14-156.000.
Thompson, Bruce R., to Caroma Industries Limited. Flushing tank. 315,948, 4-2-91, Cl. D23-313.000.
Thomsen, Peter. Pouch containing liquid soap or the like for use with a dispenser unit. 315,843, 4-2-91, Cl. D6-542.000.
Thomson, Harry S.; Raffo, David M.; and Pape, John A., to Hestair Kiddicraft Limited. Toy swing. 315,930, 4-2-91, Cl. D21-123.000.
Tokukatsu, Seiji. Hoop cutter. 315,856, 4-2-91, Cl. D8-98.000.
Tollefson, R. M.; Armstrong, Dane A.; LeMonds, David A.; Wakefield, Douglas J.; Altmann, Walter F.; and LaFond, Marcel L., to Tollycraft Yachts Corp. Yacht. 315,892, 4-2-91, Cl. D12-315.000.
Tollycraft Yachts Corp.: *See*—
Tollefson, R. M.; Armstrong, Dane A.; LeMonds, David A.; Wakefield, Douglas J.; Altmann, Walter F.; and LaFond, Marcel L., 315,892, Cl. D12-315.000.
ToPAQ, Inc.: *See*—
Hutton, Anthony; Straughan, Phillip A.; Norwood, Tiffany A.; and Pfeffer, Oliver, 315,825, Cl. D3-32.000.
Torti, Russell G.: *See*—
Claytor, Richard N.; and Torti, Russell G., 315,966, Cl. D26-122.000.
Tri Industries, Inc.: *See*—
Jacobs, Richard H., 315,885, Cl. D12-129.000.
U.S. Philips Corporation: *See*—
Joosten, Stefanus F.; and Krol, Leonardus A., 315,964, Cl. D26-63.000.
Vaporflow Technology, Inc.: *See*—
Lundy, John C., 315,950, Cl. D24-8.000.
Vernon, Frank J. Holder for greeting cards. 315,876, 4-2-91, Cl. D11-120.000.
Wakefield, Douglas J.: *See*—
Tollefson, R. M.; Armstrong, Dane A.; LeMonds, David A.; Wakefield, Douglas J.; Altmann, Walter F.; and LaFond, Marcel L., 315,892, Cl. D12-315.000.
Ward, Raymond F. Telephone dialing-key cover. 315,908, 4-2-91, Cl. D14-250.000.
Ward, Raymond F. Telephone dialing-key cover. 315,909, 4-2-91, Cl. D14-250.000.
Ward, Raymond F. Telephone dialing-key cover. 315,910, 4-2-91, Cl. D14-250.000.
Watanabe, Kenji: *See*—
Miyamoto, Akira; Ohmiya, Tokushige; Otani, Genichiro; Kawai, Setsuo; Watanabe, Kenji; Iijima, Goro; Matsubara, Takeshi; and Kameda, Takanobu, 315,919, Cl. D18-13.000.
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., to Highland Supply Corporation. Flower pot cover. 315,878, 4-2-91, Cl. D11-164.000.
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., to Highland Supply Corporation. Flower pot cover. 315,879, 4-2-91, Cl. D11-164.000.
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., to Highland Supply Corporation. Flower pot cover. 315,880, 4-2-91, Cl. D11-164.000.
Weder, Donald E., to Highland Supply Corporation. Flower pot cover. 315,881, 4-2-91, Cl. D11-164.000.
Weder, Donald E., to Highland Supply Corporation. Flower pot cover. 315,882, 4-2-91, Cl. D11-164.000.
Weder, Donald E., to Highland Supply Corporation. Flower pot cover. 315,883, 4-2-91, Cl. D11-164.000.
Weder, Erwin H.: *See*—
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,878, Cl. D11-164.000.
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,879, Cl. D11-164.000.
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,880, Cl. D11-164.000.
Weder, Wanda M.: *See*—
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,878, Cl. D11-164.000.
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,879, Cl. D11-164.000.
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 315,880, Cl. D11-164.000.
Wehmeyer, Stephen D., to Quaker Oats Company, The. Roller skate. 315,940, 4-2-91, Cl. D21-226.000.
Westland, Donald: *See*—
Hassel, H. Charles; and Westland, Donald, 315,921, Cl. D18-22.000.
Whitebread, David, to M.Y. Sports & Games Ltd. Package. 315,871, 4-2-91, Cl. D9-415.000.
Wilson, Jerry L.; Schneider, Jon; and Collins, Frederick E., to Wilson, Jerry L. Resistance strap for an exercise machine. 315,934, 4-2-91, Cl. D21-191.000.
Wilson, Jerry L.; Schneider, Jon; and Collins, Frederick E., to Wilson, Jerry L. Resistance strap for exercise machine. 315,935, 4-2-91, Cl. D21-191.000.
Wilson, Jerry L.; Schneider, Jon; and Collins, Frederick E., to Wilson, Jerry L. Resistance strap for an exercise machine. 315,936, 4-2-91, Cl. D21-191.000.
Wong, Allen; Soren, Leonid; and Lindeman, Phillip E., to Motorola Inc. Dial top-housing for telephone handset or similar article. 315,907, 4-2-91, Cl. D14-247.000.
Wood, Herbert E. Wheelchair propulsion unit. 315,886, 4-2-91, Cl. D12-133.000.
Woods Far East, Inc.: *See*—
Cheng, Willis, 315,893, Cl. D13-165.000.
Wu, J. T. Pepper mill. 315,850, 4-2-91, Cl. D7-679.000.
Wu, J. T. Mill. 315,851, 4-2-91, Cl. D7-679.000.
Yamauchi, Shigeki: *See*—
Fushiya, Fusao; and Yamauchi, Shigeki, 315,855, Cl. D8-68.000.
Zaborowski, Thaddeus; and MacLeod, Alan, to Schawbel Corporation, The. Handle for a soldering iron. 315,853, 4-2-91, Cl. D8-30.000.
Ziaylek, Michael P.: *See*—
Ziaylek, Theodore, Jr.; and Ziaylek, Michael P., 315,945, Cl. D23-244.000.
Ziaylek, Theodore, Jr.; and Ziaylek, Michael P. Dump valve for attachment to fire engine tankers. 315,945, 4-2-91, Cl. D23-244.000.

LIST OF PLANT PATENTEES

Bennett, Cecilia L. D., deceased (by O'Brien, Susan M., executor), to O'Brien, Susan. Miniature rose plant named 'Mother's Love'. 7,484, 4-2-91, Cl. 9.000.

O'Brien, Susan: *See*—
Bennett, Cecilia L. D., deceased, 7,484, Cl. 9.000.

O'Brien, Susan M., executor: *See*—
Bennett, Cecilia L. D., deceased, 7,484, Cl. 9.000.

VandenBerg, Cornelis P., to Yoder Brothers, Inc. Chrysanthemum plant named Topacio. 7,487, 4-2-91, Cl. 76.000.

VandenBerg, Cornelis P., to Yoder Brothers, Inc. Chrysanthemum plant named Naples. 7,488, 4-2-91, Cl. 77.000.

VandenBerg, Cornelis P., to Yoder Brothers, Inc. Chrysanthemum plant named Pasion. 7,489, 4-2-91, Cl. 80.000.

van Riet, Joseph E. J. Lily plant named White Sheen. 7,486, 4-2-91, Cl. 68.000.

Wimmers, Robert L. Bosc pear—Wimmers cultivar. 7,485, 4-2-91, Cl. 36.000.

Yoder Brothers, Inc.: *See*—
VandenBerg, Cornelis P., 7,487, Cl. 76.000.
VandenBerg, Cornelis P., 7,488, Cl. 77.000.
VandenBerg, Cornelis P., 7,489, Cl. 80.000.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 2ND DAY OF APRIL, 1991

Baggett, Franklin E.; and Cage, W. Franklin, to United States of America, Energy. Wedge assembly for electrical transformer component spacing. H906, 4-2-91, Cl. 403-409.100.

Cage, W. Franklin: *See*—
Baggett, Franklin E.; and Cage, W. Franklin, H906, Cl. 403-409.100.

Danby, Gordon T.; and Jackson, John W., to United States of America, Energy. Method of correcting eddy current magnetic fields in particle accelerator vacuum chambers. H909, 4-2-91, Cl. 328-233.000.

Dawson, John W., to United States of America, Energy. Method and system for improved resolution of a compensated calorimeter detector. H908, 4-2-91, Cl. 250-336.100.

General Electric Company: *See*—
Weinstein, Barry, H903, Cl. 60-757.000.

Hindenach, Laurence J., to United States of America, Air Force. Adaptive two dimensional shading for batch synthetic aperture radar using phased array antenna. H910, 4-2-91, Cl. 342-25.000.

Jackson, John W.: *See*—
Danby, Gordon T.; and Jackson, John W., H909, Cl. 328-233.000.

Mitsubishi Oil Co., Ltd.: *See*—
Tate, Kazuhito; Tsuchimoto, Koji; and Yanagida, Kazuhiro, H907, Cl. 423-448.000.

Rottenberg, Mark M., to United States of America, Army. Fin assembly. H905, 4-2-91, Cl. 244-3.280.

Rousseau, David G., to United States of America, Navy. Air cooled helmet. H902, 4-2-91, Cl. 2-414.000.

Schmidlin, Albertus E., to United States of America, Army. Safe secure survivable door locking assembly for an overpack container. H904, 4-2-91, Cl. 206-3.000.

Tate, Kazuhito; Tsuchimoto, Koji; and Yanagida, Kazuhiro, to Mitsubishi Oil Co., Ltd. Process for producing conductive graphite fiber. H907, 4-2-91, Cl. 423-448.000.

Tsuchimoto, Koji: *See*—
Tate, Kazuhito; Tsuchimoto, Koji; and Yanagida, Kazuhiro, H907, Cl. 423-448.000.

United States of America
Air Force: *See*—
Hindenach, Laurence J., H910, Cl. 342-25.000.
Army: *See*—
Rottenberg, Mark M., H905, Cl. 244-3.280.
Schmidlin, Albertus E., H904, Cl. 206-3.000.
Energy: *See*—
Baggett, Franklin E.; and Cage, W. Franklin, H906, Cl. 403-409.100.
Danby, Gordon T.; and Jackson, John W., H909, Cl. 328-233.000.
Dawson, John W., H908, Cl. 250-336.100.
Navy: *See*—
Rousseau, David G., H902, Cl. 2-414.000.

Weinstein, Barry, to General Electric Company. Cool tip combustor. H903, 4-2-91, Cl. 60-757.000.

Yanagida, Kazuhiro: *See*—
Tate, Kazuhito; Tsuchimoto, Koji; and Yanagida, Kazuhiro, H907, Cl. 423-448.000.

CLASSIFICATION OF PATENTS

ISSUED APRIL 2, 1991

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2.1 A 5,003,630
6 5,003,631
5,003,632
9 5,003,633
46 5,003,634
69 5,003,635
145 5,003,636
160 5,003,637
167 5,003,638
187 5,003,639
199 5,003,640

CLASS 4

253 5,003,641
287 5,003,642
313 5,003,643
324 5,003,644
325 5,004,462
448 5,003,645
542 5,003,646
559 5,003,647
661 5,003,648

CLASS 5

8 5,003,649
9.1 5,003,650
109 5,003,651
129 5,003,652
449 5,003,653
453 5,003,654
496 5,003,655

CLASS 7

169 5,003,656

CLASS 15

104.33 5,003,657
185 5,003,658
209 D 5,003,659
244.1 5,003,660
301 5,003,661
330 5,003,662
366 5,003,663

CLASS 16

6 5,003,664

CLASS 19

0.22 5,003,668
49 5,003,669
66 CC 5,003,670

CLASS 24

265 A 5,003,671
300 5,003,672
662 5,003,673

CLASS 28

109 5,003,674
141 5,003,675
209 5,003,676
220 5,003,677

CLASS 29

10 5,003,678
25.35 5,003,679
227 5,003,680
239 5,003,681
259 5,003,682
425 5,003,683
447 5,003,684
525 5,003,685
596 5,003,686
600 5,003,687
603 5,003,688
613 5,003,689
727 5,003,690
5,003,691
834 5,003,692
849 5,003,693

CLASS 30

49 5,003,694
193 5,003,695
299 5,003,696

CLASS 33

244 5,003,697
268 5,003,698
379 5,003,699
401 5,003,700
409 5,003,701
501.19 5,003,702
638 5,003,703
775 5,003,704

CLASS 34

54 5,003,705
92 5,003,706
104 5,003,707

CLASS 36

44 5,003,708
107 5,003,709
117 5,003,710
120 5,003,711

CLASS 37

80 R 5,003,712

CLASS 40

113 5,003,713
414 5,003,714
442 5,003,715
503 5,003,716
518 5,003,717

CLASS 43

3 5,003,718
5,003,722
17.5 5,003,719
42.13 5,003,723
42.39 5,003,720
132.1 5,003,721

CLASS 44

302 5,004,479
387 5,004,480
398 5,004,478
435 5,004,481
438 Re.33,562

CLASS 47

25 5,003,724
39 5,003,725
48.5 5,003,726

CLASS 49

479 5,003,792
504 5,003,727

CLASS 51

165.8 5,003,728
283 R 5,003,729
325 5,003,730
418 5,003,731

CLASS 52

86 5,003,733
94 5,003,732
101 5,003,734
105 5,003,735
108 5,003,736
126.2 5,003,737
202 5,003,738
219 5,003,739
239 5,003,740
280 5,003,741
282 5,003,742
5,003,743
308 5,003,744
316 5,003,745
404 Re.33,563
589 5,003,746
656 5,003,747
693 5,003,748
703 5,003,749
742 5,003,750

CLASS 53

215 5,003,751
399 5,003,752
415 5,003,753
459 5,003,754
466 5,003,755

CLASS 54

79 5,003,756

CLASS 55

16 5,004,482
20 5,004,483
53 5,004,484
160 5,004,485
222 5,004,486
269 5,004,487

CLASS 56

17.4 5,003,757
202 5,003,758
249 5,003,759
400.06 5,003,760

CLASS 57

58.52 5,003,761
281 5,003,762
297 5,003,763
333 5,003,764

CLASS 59

78.1 5,003,765

CLASS 60

39.142 5,003,767
39.15 5,003,766
39.23 5,003,768
39.281 5,003,769
60.52 5,004,490
226.2 5,003,770
243 5,003,771
259 5,003,772
262 5,003,773
275 5,003,774
313 5,003,775
434 5,003,776
517 5,003,778
520 5,003,777
527 5,003,779
585 5,003,780
600 5,003,781
648 5,003,782

CLASS 62

51.2 5,003,783
124 5,003,784
131 5,003,785
156 5,003,786
185 5,003,787
238.7 5,003,788
304 5,003,789
389 5,003,790

CLASS 63

32 5,003,791

CLASS 65

18.2 5,004,488
32.2 5,004,489
106 5,004,491
289 5,004,492

CLASS 66

9 B 5,003,793

CLASS 68

3 R 5,003,794

CLASS 70

55 5,003,795
107 5,003,796
180 5,003,797
238 5,003,798
247 5,003,799
264 5,003,800
278 5,003,801
333 A 5,003,802
416 5,003,803

CLASS 71

88 5,004,493
92 5,004,494

CLASS 72

39 5,003,804
53 5,003,805
260 5,003,806
351 5,003,807
405 5,003,808
446 5,003,809

CLASS 73

3 5,003,810
12 5,003,811
31.06 5,003,812
49.2 5,003,813
59 5,003,814
105 5,003,815
117.3 5,003,816
118.1 5,003,817
121 5,003,818
146 5,003,819
181 5,003,820
201 5,003,821
204.23 5,003,822
293 5,003,823
651 5,003,824
704 5,003,825
828 5,003,826
861.24 5,003,827
861.33 5,003,828
862.12 5,003,829
863.83 5,003,830
865.9 5,003,831

CLASS 74

51 5,003,832
87 5,003,833
339 5,003,834
411 5,003,835
425 5,003,836
501.5 R 5,003,837
502.4 5,003,838
551.1 5,003,839
594.2 5,003,840
594.4 5,003,841
867 5,003,842

CLASS 75

10.22 5,004,495
10.28 5,004,496
229 5,004,497
233 5,004,498
254 5,004,499
422 5,004,500

CLASS 76

78.1 5,003,843

CLASS 81

3.2 5,003,844
3.4 5,003,845
9.42 5,003,846
57.39 5,003,847
176.2 5,003,848
184 5,003,849
436 5,003,850

CLASS 82

1.11 5,003,851
158 5,003,852

CLASS 83

318 5,003,853
331 5,003,854
346 5,003,855
576 5,003,856

CLASS 84

266 5,003,857
280 5,003,858
423 R 5,003,859
609 5,003,860

CLASS 89

1.55 5,003,861
133 5,003,862

CLASS 92

61 5,003,863
132 5,003,864

CLASS 98

1.5 5,003,865
2.02 5,003,866
31.6 5,003,867

CLASS 99

357 5,003,868
453 5,003,869

CLASS 101

127.1 5,003,870
148 5,003,871
163 5,003,872
219 5,003,873
228 5,003,889
348 5,003,874
350 5,003,875
5,003,876
363 5,003,877
415.1 5,003,878

CLASS 102

204 5,003,879
314 5,003,880
337 5,003,881
387 5,003,882
476 5,003,883
5,003,884
494 5,003,885
521 5,003,886
531 5,003,887

CLASS 104

17.002 5,003,888

CLASS 106

35 5,004,501
287.13 5,004,502
287.18 5,004,503
456 5,004,504
685 5,004,505
729 5,004,506

CLASS 110

239 5,003,890
341 5,003,891
346 5,003,892
5,003,893

CLASS 111

178 5,003,894

CLASS 112

103 5,003,895
121.11 5,003,896
121.12 5,003,897
220 5,003,898
221 5,003,899
242 5,003,900
316 5,003,901
418 5,003,902

CLASS 114

102 5,003,903
140 5,003,904
201 R 5,003,905
211 5,003,906
221 R 5,003,907
229 5,003,908
238 5,003,909
304 5,003,910

CLASS 116

28 R 5,003,911
63 P 5,003,912
208 5,003,913
332 5,003,914

CLASS 118

46 5,003,915
429 5,003,916
653 5,003,917
665 5,003,918
716 5,003,919

CLASS 119

5 5,003,921
15 5,003,922
19 5,003,923
44 5,003,924
51.04 5,003,925
62 5,003,926
72.5 5,003,927
73 5,003,928
106 5,003,930
120 5,003,929
163 5,003,920

CLASS 122

4 D 5,003,931

CLASS 123

52 MB 5,003,932
52 MC 5,003,933
52 MV 5,003,934
55 R 5,003,935
78 AA 5,003,936
90.12 5,003,937
90.14 5,003,938
90.16 5,003,939
90.54 5,003,940
142.5 R 5,003,941
190 A 5,003,942
198 D 5,003,943
299 5,003,944
310 5,003,945
335 5,003,946
339 5,003,947
352 5,003,948
382 5,003,949
422 5,003,950
425 5,003,951
478 5,003,952
5,003,953
479 5,003,954
489 5,003,955
494 5,003,956
564 5,003,957
635 5,003,958
647 5,003,959

CLASS 126

39 BA 5,003,960
110 R 5,003,961

CLASS 127

58 5,004,507

CLASS 128

4 5,003,964
11 5,003,962
5,003,963
24 AA 5,003,965
39 5,003,966
77 5,003,967
87 B 5,003,968
87 R 5,003,969
90 5,003,970
156 5,003,971
158 5,003,972
201.25 5,003,973
5,003,974
419 PG 5,003,975
5,003,976
633 5,003,977
640 5,003,978
653 A 5,003,979
653 R 5,003,980
677 5,003,981
695 5,003,982
704 5,003,983
710 5,003,984
716 5,003,985
731 5,003,986
734 5,003,987
771 5,003,988
772 5,003,989
5,003,990
784 5,003,991
785 5,003,992
842 5,003,993
848 5,003,994

CLASS 131

84.2 5,003,996
359 5,003,995

CLASS 132

73 5,003,997

CLASS 134

22.12 5,003,998
105 5,003,999
108 5,004,000

CLASS 135

97 5,004,001

CLASS 137

39 5,004,002
75 5,004,003
195 5,004,004
269.5 5,004,005
501 5,004,006
5,004,007
504 5,004,008
512.3 5,004,009
513.3 5,004,010
556 5,004,011
560 5,004,012
614.05 5,004,013
624.12 5,004,014
625.65 5,004,440
625.68 5,004,015

CLASS 138

96 T 5,004,016
106 5,004,017
149 5,004,018

CLASS 139

91 5,004,019

CLASS 140

93.6 5,004,020

CLASS 141

67 5,004,021
114 5,004,022
208 5,004,023
298 5,004,024
364 5,004,025

CLASS 144

3 D 5,004,026
136 R 5,004,027
176 5,004,028
287 5,004,029

CLASS 148

22 5,004,508
23 5,004,509
146 5,004,510

CLASS 152

225 R 5,004,030
538 5,004,031

CLASS 156

89 5,004,511
153 5,004,512
191 5,004,513
251 5,004,514
350 5,004,515
463 5,004,516
567 5,004,517
568 5,004,518
620.4 5,004,519
630 5,004,520
645 5,004,521

CLASS 159

47.003 5,004,522

CLASS 160

84.1 5,004,032
178.1 5,004,033

CLASS 162

76 5,004,523

CLASS 164

97 5,004,034
5,004,035
5,004,036
244 5,004,037
305 5,004,038
361 5,004,039
453 5,004,040

CLASS 165

8 5,004,041
41 5,004,042
118 5,004,043
145 5,004,044
149 5,004,045
156 5,004,046
158 5,004,047

CLASS 166

70 5,004,048
228 5,004,049
248 5,004,050
357 5,004,051

CLASS 168

4 5,004,052

CLASS 172

375 5,004,053

CLASS 173

12 5,004,054

CLASS 174

15.7 5,004,865
35 GC 5,004,866
5,004,867
76 5,004,868
84 C 5,004,869

CLASS 175

20 5,004,055
293 5,004,056
408 5,004,057

CLASS 177

25.13 5,004,058
210 R 5,004,059

CLASS 178

18 5,004,870
5,004,871
5,004,872

CLASS 180

6.44 5,004,060
65.5 5,004,061
68.5 5,004,081
69.21 5,004,062
79.1 5,004,063
197 5,004,064

CLASS 181

160 5,004,066
188 5,004,067
276 5,004,068
282 5,004,069
286 5,004,070

CLASS 182

3 5,004,071
45 5,004,072

CLASS 184

6.12 5,004,073
105.1 5,004,074

CLASS 187

8.41 5,004,075
130 5,004,076

CLASS 188

2 D 5,004,077
218 A 5,004,078
282 5,004,079
299 5,004,080

CLASS 190

18 R 5,004,091

CLASS 192

0.033 5,004,084
3.26 5,004,082
5 5,004,083
58 B 5,004,085
85 C 5,004,086
89 B 5,004,087
106.2 5,004,088
107 M 5,004,089
112 5,004,090

CLASS 198

347.3 5,004,092
430 5,004,093
460 5,004,094
660 5,004,095
666 5,004,096
803.01 5,004,097
847 5,004,098

CLASS 200

83 P 5,004,873
5,004,876
144 B 5,004,877
144 R 5,004,874
5,004,878
295 5,004,879
400 5,004,875
521 5,004,880

CLASS 204

52.1 5,004,525
73 A 5,004,526
82 5,004,527
129.2 5,004,528
212 5,004,529
224 M 5,004,530
243 R 5,004,524
307 5,004,531
415 5,004,532

CLASS 206

83.5 5,004,099
315.2 5,004,100
343 5,004,101
372 5,004,103
386 5,004,102
526 5,004,104
576 5,004,105
581 5,004,106

CLASS 208

50 5,004,533

CLASS 210

90 5,004,535
136 5,004,536
164 5,004,534
192 5,004,537
198.2 5,004,538
222 5,004,539
232 5,004,540
251 5,004,541
356 5,004,542
490 5,004,543
5,004,544
510.1 5,004,545
635 5,004,546
5,004,547
646 5,004,548
699 5,004,549
710 5,004,550
763 5,004,551
789 5,004,552

CLASS 211

26 5,004,107

CLASS 212

255 5,004,108

CLASS 215

1 C 5,004,109
232 5,004,110
5,004,111
252 5,004,112
332 B1 4,392,580
358 5,004,113

CLASS 219

10.55 E 5,004,882
10.77 5,004,881
69.12 5,004,883
73 5,004,884
73.2 5,004,885
76.14 5,004,886
85.16 5,004,887
121.520 5,004,888
121.61 5,004,889
121.83 5,004,890
388 5,004,891
464 5,004,892
505 5,004,893
521 5,004,894
528 5,004,895

CLASS 220

3.3 5,004,115
4.34 5,004,116
85 P 5,004,117
216 5,004,118
247 5,004,119
296 5,004,114
366 5,004,129
414 5,004,120
458 5,004,121

CLASS 221

155 5,004,122

CLASS 222

94 5,004,123
136 5,004,124
145 5,004,125
153 5,004,126
209 Re.33,564
521 5,004,127
527 5,004,128
590 5,004,130
600 5,004,131

CLASS 223

1 5,004,132

CLASS 224

3.14 5,004,185
42.45 R 5,004,133
209 5,004,134
210 5,004,135
253 5,004,136
274 5,004,137
312 5,004,138
324 5,004,139

CLASS 227

8 5,004,140
112 5,004,141
155 5,004,142

CLASS 228

126 5,004,143

CLASS 229

87.190 5,004,144
117.26 5,004,145
120.31 5,004,146
198.2 5,004,147

CLASS 232

35 5,004,148

CLASS 235

437 5,004,896
441 5,004,897
475 5,004,898
492 5,004,899

CLASS 236

49.3 5,004,149

CLASS 237

12.3 A 5,004,150

CLASS 239

2.2 5,004,151
8 5,004,152
81 5,004,153
96 5,004,154
127 5,004,155
130 5,004,156
205 5,004,157
310 5,004,158
337 5,004,159
525 5,004,160
542 5,004,161
585 5,004,162
661 5,004,163
666 5,004,164

CLASS 241

21 5,004,165
36 5,004,166
91 5,004,167
101.7 5,004,168
192 5,004,169

CLASS 242

18 R 5,004,170
35.6 R 5,004,171
54 R 5,004,172
57 5,004,173
58.6 5,004,174
68.5 5,004,175
71.1 5,004,176
99 5,004,177
107 5,004,178
118.6 5,004,179
198 5,004,180
225 5,004,181
232 5,004,182

CLASS 244

3.11 5,004,183
3.22 5,004,184
3.25 5,004,186
53 B 5,004,187
137.002 5,004,188
219 5,004,189

CLASS 246

428 5,004,190

CLASS 248

48.2 5,004,191
49 5,004,192
59 5,004,193
74.5 5,004,194
99 5,004,195
118.3 5,004,196
188.9 5,004,197
225.1 5,004,198
231.8 5,004,199
243 5,004,201
5,004,202
250 5,004,200
285 5,004,203
449 5,004,204
476 5,004,205
585 5,004,206
632 5,004,207

CLASS 249

91 5,004,208

CLASS 250

201.5 5,004,900
5,004,901
201.8 5,004,902
207 5,004,904
208.1 5,004,903
5,004,905
214 A 5,004,906
214 AG 5,004,907
221 5,004,908
223 B 5,004,909
226 5,004,910
227.14 5,004,912
227.21 5,004,911
5,004,913
227.27 5,004,914
231.14 5,004,915
235 5,004,916
236 5,004,917
304 5,004,920
311 5,004,918
5,004,919
337 5,004,921
340 5,004,922
341 5,004,923
442.1 5,004,924
491.1 5,004,925
492.2 5,004,927
492.3 5,004,926
559 5,004,928
561 5,004,929
5,004,930

CLASS 251

144 5,004,209
279 5,004,210

CLASS 252

8.51 5,004,553
54.6 5,004,554
62.9 5,004,555
95 5,004,558
99 5,004,556
174.24 5,004,557
345 5,004,559
511 5,004,561
518 5,004,562
5,004,563
546 5,004,564
700 5,004,565

CLASS 256

47 5,004,211

CLASS 260

403 5,004,566
408 5,004,567
410 5,004,568
410.6 5,004,569
427 5,004,570

CLASS 261

91 5,004,571

CLASS 264

40.5 5,004,576
46.6 5,004,572
61 5,004,573
101 5,004,574
112 5,004,577
136 5,004,575
514 5,004,578
517 5,004,579

CLASS 266

116 5,004,213
170 5,004,212

CLASS 267

64.12 5,004,214
140.1 5,004,215
179 5,004,216

CLASS 271

10 5,004,217
35 5,004,218
116 5,004,219
184 5,004,220
194 5,004,221
225 5,004,222
275 5,004,223

CLASS 272

18 5,004,225
70 5,004,224
93 5,004,226
119 5,004,227
125 5,004,228
127 5,004,229
134 5,004,230
143 5,004,231

CLASS 273

21 5,004,233
26 R 5,004,234
29 A 5,004,235
80 B 5,004,236
80.2 5,004,237
121 B 5,004,238
162 E 5,004,240
162 F 5,004,239
167 H 5,004,241
169 5,004,242
195 A 5,004,243
240 5,004,244
241 5,004,245
246 5,004,246
376 5,004,247
435 5,004,232

CLASS 277

37 5,004,248
207 R 5,004,249
236 5,004,250

CLASS 280

32.7 5,004,251
33.992 5,004,252
47.315 5,004,254
47.38 5,004,253
79.5 5,004,255
87.042 5,004,256
112.2 5,004,257
259 5,004,258
304.1 5,004,259
414.1 5,004,260
605 5,004,065
612 5,004,261
615 5,004,262
645 5,004,263
707 5,004,264
5,004,265
743 5,004,266
766.1 5,004,267
804 5,004,268
837 5,004,269

CLASS 283

48.1 5,004,270
65 5,004,271

CLASS 285

24 5,004,272
27 5,004,273
288 5,004,274
373 5,004,275

CLASS 292

126 5,004,276
166 5,004,277
169.18 5,004,278
288 5,004,279
341.16 5,004,280

CLASS 293

118 5,004,281

CLASS 294

16 5,004,282
61 5,004,283
118 5,004,284

CLASS 296

1.1 5,004,285
24.1 5,004,286
57.1 5,004,287
97.11 5,004,288
97.12 5,004,289
99.1 5,004,290
116 5,004,291
153 5,004,292
166 5,004,293

CLASS 297

180 5,004,294
191 5,004,295
194 5,004,296
270 5,004,297
306 B1 4,198,094

CLASS 299

5 5,004,298

CLASS 303

15 5,004,299
5,004,300
115 5,004,301

CLASS 307

10.2 5,004,931
201 5,004,932
269 5,004,933
303 5,004,934
353 5,004,935
443 5,004,936
5,004,937
448 5,004,938
475 5,004,939

CLASS 310

36 5,004,940
49 R 5,004,941
89 5,004,942
239 5,004,943
266 5,004,944
328 5,004,945
5,004,946

CLASS 312

140 5,004,303
201 5,004,304
214 5,004,302
5,004,305
319 5,004,306

CLASS 313

486 5,004,948
492 5,004,949
582 5,004,950
631 5,004,951

CLASS 315

3.5 5,004,952
86 5,004,953
106 5,004,954
119 5,004,955
169.3 5,004,956
199 5,004,957
224 5,004,947
241 P 5,004,958
291 5,004,959
307 5,004,960

CLASS 318

65 5,004,961
85 5,004,962
128 5,004,964
254 5,004,965
446 5,004,966
568.1 5,004,967
576 B1 4,459,526
615 5,004,968

CLASS 320

13 5,004,963

CLASS 323

235 5,004,969
277 5,004,970
312 5,004,971
320 5,004,972

CLASS 324

117 R 5,004,974
121 R 5,004,975
154 R 5,004,976
158 P 5,004,977
158 R 5,004,973
5,004,978

160 5,004,979
166 5,004,980
207.22 5,004,981
5,004,982
322 5,004,983
402 5,004,984
727 5,004,985

CLASS 330

257 5,004,986

CLASS 331

70 5,004,987
116 R 5,004,988
117 R 5,004,989

CLASS 333

22 R 5,004,990
168 5,004,991
202 5,004,992
208 5,004,993

CLASS 337

66 5,004,994
266 5,004,995

CLASS 338

36 5,004,996

CLASS 340

436 5,004,997
507 5,004,998
539 5,004,999
550 5,005,000
551 5,005,001
574 5,005,002
587 5,005,003
600 5,005,004
604 5,005,005
611 5,005,006
650 5,005,007
653 5,005,008
705 5,005,009
5,005,010
728 5,005,011
750 5,005,012
825.44 5,005,013
5,005,014
962 5,005,015

CLASS 341

142 5,005,016

CLASS 342

172 5,005,017
203 5,005,018

CLASS 343

700 MS 5,005,019
713 5,005,020
717 5,005,021
753 5,005,022
756 5,005,023

CLASS 346

1.1 5,005,024
25 5,005,025
76 PH 5,005,026
5,005,027
76 R 5,005,028
107 R 5,005,029

CLASS 350

1.2 5,004,307
1.7 5,004,308
3.68 5,004,309
6.8 5,004,310
6.9 5,004,311
96.13 5,004,312
96.14 5,004,313
5,004,314
5,004,447
96.15 5,004,315
5,004,316
96.20 5,004,317
5,004,318
162.21 5,004,319
276 R 5,004,320
320 5,004,321
5,004,322
346 5,004,323
347 R 5,004,324
354 5,004,325
375 5,004,326
398 5,004,327
416 5,004,328
427 5,004,329
432 5,004,330
443 5,004,331
453 5,004,332

CLASS 351

45 5,004,333
54 5,004,334

CLASS 352

58 5,004,335

CLASS 353

122 5,004,336

CLASS 354

82 5,005,030
106 5,005,031
149.11 5,005,032
204 5,005,034
206 5,005,035
289.1 5,005,033
322 5,005,036
400 5,005,037
5,005,038
402 5,005,039
5,005,040
407 5,005,041
412 5,005,042
442 5,005,047

CLASS 355

27 5,005,043
40 5,005,044
68 5,005,045
77 5,005,046
93 5,005,048
208 5,005,049
5,005,050
221 5,005,051
231 5,005,052
245 5,005,053
273 5,005,054
311 5,005,055

CLASS 356

124 5,004,337
218 5,004,338
241 5,004,339
243 5,004,340
350 5,004,341
5,004,342
5,004,343
5,004,344
353 5,004,345
360 5,004,346
394 5,004,347
401 5,004,348
402 5,004,349

CLASS 357

2 5,005,056
17 5,005,057
5,005,058
22 5,005,059
23.13 5,005,061
23.5 5,005,060
23.6 5,005,072
24 5,005,062
5,005,063
27 5,005,064
38 5,005,065
43 5,005,066
54 5,005,067
59 5,005,068
72 5,005,069
74 5,005,070
85 5,005,071

CLASS 358

21 R 5,005,073
31 5,005,074
135 5,005,076
140 5,005,077
5,005,078
158 5,005,079
160 5,005,080
167 5,005,081
174 5,005,082
181 5,005,083
194.1 5,005,084
213.11 5,005,085
227 5,005,086
5,005,087

CLASS 360

69 5,005,088
77.08 5,005,089
92 5,005,090
96.5 5,005,091
99.06 5,005,092
5,005,093
105 5,005,094
106 5,005,095
113 5,005,096
121 5,005,097
130.34 5,005,098
132 5,005,099

CLASS 361

35 5,005,100
231 5,005,101
313 5,005,102
5,005,103
355 5,005,104
398 5,005,105
424 5,005,106
540 5,005,107

CLASS 362

31 5,005,108
61 5,005,109
84 5,005,110
156 5,005,111

CLASS 363

21 5,005,112
37 5,005,113
43 5,005,114
159 5,005,115

CLASS 364

188 5,005,116
200 5,005,117
5,005,118
5,005,119
5,005,120
5,005,121
5,005,122
400 5,005,123
401 5,005,124
403 5,005,125
413.13 5,005,126
419 5,005,127
424.02 5,005,128
424.03 5,005,129
426.01 5,005,130
426.02 5,005,131
5,005,132
426.04 5,005,133
474.01 5,005,134
474.35 5,005,135
490 5,005,136
514 5,005,137
519 5,005,138
5,005,139
550 5,005,140
5,005,141
5,005,142
554 5,005,143
565 5,005,144
571.02 5,005,145
573 5,005,146
578 5,005,147
5,005,148
728.01 5,005,149
736 5,005,150
900 5,005,151
5,005,152
5,005,153

CLASS 365

96 5,005,154
185 5,005,155
189.05 5,005,156
193 5,005,157
200 5,005,158

CLASS 366

69 5,004,350
152 5,004,351
208 B1 4,235,553
343 5,004,352
349 5,004,353

CLASS 367

57 5,005,159

CLASS 368

95 5,005,160
295 5,005,161

CLASS 369

44.12 5,005,162
44.36 5,005,163
48 5,005,164
58 5,005,165

CLASS 370

1 5,005,166
4 5,005,167
24 5,005,168
76 5,005,169
84 5,005,170
110.1 5,005,171

CLASS 371

18 5,005,172
22.6 5,005,173
68.3 5,005,174

CLASS 372

6 5,005,175
10 5,005,176
34 5,005,177
36 5,005,178
46 5,005,179
57 5,005,180
59 5,005,181
72 5,005,182

CLASS 374

29 5,004,354
194 5,004,355

CLASS 375

1 5,005,183
14 5,005,184
15 5,005,185
82 5,005,186
94 5,005,187
5,005,188
101 5,005,189
108 5,005,190
116 5,005,191

CLASS 377

8 5,005,192
33 5,005,193

CLASS 378

35 5,005,075
53 5,005,194
62 5,005,195
207 5,005,196

CLASS 379

21 5,005,197
58 5,005,198
375 5,005,199

CLASS 380

30 5,005,200

CLASS 381

24 5,005,201
25 5,005,202
43 5,005,203
51 5,005,204

CLASS 382

3 5,005,205
56 5,005,206

CLASS 383

63 5,004,356

CLASS 384

121 5,004,357
446 5,004,358
526 5,004,359

CLASS 388

816 5,005,207

CLASS 400

144.2 5,004,360

CLASS 401

53 5,004,362
75 5,004,363
110 5,004,364
258 5,004,365

CLASS 403

2 5,004,366
46 5,004,367
166 5,004,368
232.1 5,004,369
277 5,004,370
327 5,004,371

CLASS 405

63 5,004,372
131 5,004,373
154 5,004,374
230 5,004,375
284 5,004,376

CLASS 406

120 5,004,377

CLASS 407

106 5,004,378
113 5,004,379
114 5,004,380

CLASS 408

31 5,004,381
60 5,004,382
211 5,004,383
230 5,004,384

CLASS 409

180 5,004,385

CLASS 410

62 5,004,386
69 5,004,387
107 5,004,388

CLASS 411

304 5,004,389
340 5,004,390
366 5,004,361

CLASS 414

6 5,004,391
21 5,004,392
331 5,004,393
346 5,004,394
412 5,004,395
417 5,004,396
686 5,004,397
723 5,004,398
729 5,004,399
786 5,004,400
5,004,401

CLASS 415

137 5,004,402

CLASS 417

53 5,004,403
131 5,004,405
273 5,004,406

CLASS 418

1 5,004,407
15 5,004,408
58 5,004,409
63 5,004,410
132 5,004,412

CLASS 419

65 5,004,580

CLASS 420

487 5,004,581

CLASS 422

56 5,004,582
58 5,004,583
5,004,584
5,004,585
164 5,004,586
171 B1 3,870,474
186.19 5,004,587

CLASS 423

226 5,004,588
315 5,004,589
578 R 5,004,591
652 5,004,592

CLASS 424

10 5,004,593
47 5,004,594
48 5,004,595
52 5,004,596
5,004,597
59 5,004,598
61 5,004,599
76.3 5,004,600
78 5,004,601
5,004,602
81 5,004,603
85.5 5,004,604
85.6 5,004,605
85.8 5,004,606
87 Re.33,565
88 5,004,607
5,004,608
94.3 5,004,609
448 5,004,610
450 5,004,611
5,004,612
465 5,004,613
5,004,651
466 5,004,614
692 5,004,615

CLASS 425

117 5,004,411
182 5,004,413
185 5,004,414
297 5,004,415
447.2 5,004,590
564 5,004,416

CLASS 426

102 5,004,616
233 5,004,617
281 5,004,618
297 5,004,619
304 5,004,620
386 5,004,621
513 5,004,622
564 5,004,623
623 5,004,624

CLASS 427

38 5,004,625
58 5,004,626
133 5,004,627
204 5,004,629
208.8 5,004,630
385.5 5,004,631
389.9 5,004,628
410 5,004,632

CLASS 428

9 5,004,633
31 5,004,634
33 5,004,635
43 5,004,636
5,004,637
95 5,004,638
138 5,004,639
195 5,004,640
208 5,004,641
222 5,004,642
246 5,004,643
323 5,004,644
5,004,645
344 5,004,646
349 5,004,647
364 5,004,648
461 5,004,649
463 5,004,650
611 5,004,652
615 5,004,653

CLASS 429

50 5,004,654
82 5,004,655
162 5,004,656
193 5,004,657

CLASS 430

5 5,004,658
14 5,004,659
17 5,004,660
59 5,004,661
5,004,662
5,004,663
106.6 5,004,664
5,004,665
110 5,004,666
255 5,004,667
256 5,004,668
264 5,004,669
265 5,004,670
286 5,004,671
314 5,004,672
325 5,004,673
333 5,004,674
377 5,004,675
382 5,004,677
398 5,004,676
548 5,004,678
567 5,004,679
603 5,004,680

CLASS 433

26 5,004,417
77 5,004,418
143 5,004,419
172 5,004,420
173 5,004,421
175 5,004,422

CLASS 434

22 5,004,423
301 5,004,424

CLASS 435

2 5,004,681
6 5,004,682
7.21 5,004,683
7.31 5,004,699
8 5,004,684
25 5,004,685
69.1 5,004,686
5,004,687
69.3 5,004,688
69.51 5,004,689
138 5,004,690
172.3 5,004,691
183 5,004,692
235.1 5,004,693
240.27 5,004,694
253.1 5,004,695

CLASS 436

51 5,004,696
547 5,004,697

CLASS 437

3 5,004,698
42 5,004,700
47 5,004,701
57 5,004,702
67 5,004,703
195 5,004,704
225 5,004,705

CLASS 439

37 5,004,425
82 5,004,426
101 5,004,427
191 5,004,428
326 5,004,429
350 5,004,430
358 5,004,431
417 5,004,432
502 5,004,433
636 5,004,434
652 5,004,435
752 5,004,436
811 5,004,437
825 5,004,438

CLASS 440

2 5,004,439

CLASS 446

211 5,004,441
302 5,004,442
355 B1 4,349,987
392 5,004,443

406 5,004,444
478 5,004,445

CLASS 449

1 5,004,446

CLASS 452

21 5,003,666
125 5,003,667
185 5,003,665

CLASS 455

32 5,005,209
115 5,005,210
603 5,005,211
606 5,005,212
617 5,005,213

CLASS 474

111 5,004,448
138 5,004,449
242 5,004,450

CLASS 493

359 5,004,451
414 5,004,452

CLASS 494

39 5,004,453

CLASS 501

27 5,004,706
37 5,004,707
96 5,004,708
97 5,004,709
103 5,004,710
5,004,711
126 5,004,712
134 5,004,713
5,004,714
136 5,004,715
141 5,004,716

CLASS 502

50 5,004,717
217 5,004,718
242 5,004,719

CLASS 505

1 5,004,720
5,004,721
5,004,722
5,004,723
5,004,724
5,004,725
5,004,726

CLASS 514

12 5,004,728
29 5,004,729
5,004,731
5,004,732
5,004,734
029 5,004,730
5,004,733
134 5,004,735
161 5,004,736
182 5,004,737
195 5,004,738
210 5,004,739
5,004,740
221 5,004,741
226.5 5,004,742
227.8 5,004,743
247 5,004,744
254 5,004,745
283 5,004,758
299 5,004,746
309 5,004,747
350 5,004,748
372 5,004,749
382 5,004,750
390 5,004,751
530 5,004,752
531 5,004,753
570 5,004,754
653 5,004,755
655 5,004,756
694 5,004,757

CLASS 521

149 5,004,760

CLASS 522

3 5,004,761
121 5,004,762

CLASS 523

161 5,004,763
400 5,004,764
434 5,004,765

CLASS 524

30 5,004,766
5,004,767
5,004,768
43 5,004,769
62 5,004,772
89 5,004,759
99 5,004,770
161 5,004,771
178 5,004,773
262 5,004,774
371 5,004,775
377 5,004,776
433 5,004,777
474 5,004,778
591 5,004,779

CLASS 525

27 5,004,780
54.11 5,004,781
64 5,004,782
77 5,004,783
123 5,004,784
305 5,004,785
332.1 5,004,787
344 5,004,786
504 5,004,788
506 5,004,789

CLASS 526

242 5,004,790
258 5,004,560

CLASS 527

300 5,004,791

CLASS 528

15 5,004,792
5,004,793
52 5,004,794
73 5,004,795
179 5,004,796
206 5,004,797
230 5,004,798
351 5,004,800
360 5,004,801
389 5,004,799

CLASS 530

322 5,004,818
380 5,004,802
383 5,004,803
387 5,004,804
399 5,004,805
415 5,004,806

CLASS 534

618 5,004,807

CLASS 536

18.2 5,004,833
27 5,004,810
29 5,004,809
56 5,004,808

CLASS 540

145 5,004,811

CLASS 546

201 5,004,812

CLASS 548

463 5,004,813

CLASS 549

294 5,004,814
328 5,004,815
462 5,004,816
557 5,004,817

CLASS 552

244 5,004,819

CLASS 556

53 5,004,820
70 5,004,821
115 5,004,822
136 5,004,823
412 5,004,824

CLASS 558

131 5,004,825
169 5,004,826
277 5,004,827

CLASS 560

224 5,004,828

CLASS 562

113 5,004,829
413 5,004,830
475 5,004,831
490 5,004,832

CLASS 564

142 5,004,834
153 5,004,835

CLASS 568

333 5,004,836
342 5,004,837
347 5,004,838
390 5,004,839
486 5,004,840
640 5,004,842
670 5,004,843
678 5,004,841
880 5,004,844
885 5,004,845
940 5,004,846

CLASS 570

186 5,004,847
206 5,004,848
224 5,004,849

CLASS 585

1 5,004,850
260 5,004,851
322 5,004,852
481 5,004,853
489 5,004,854
5,004,855
500 5,004,856
507 5,004,857
667 5,004,858
741 5,004,859
812 5,004,860
818 5,004,861
867 5,004,862

CLASS 600

30 5,004,454

CLASS 604

29 5,004,459
43 5,004,455
53 5,004,456
158 5,004,457
175 5,004,458
228 5,004,460
265 5,004,461
329 5,004,463
338 5,004,464
385.1 5,004,465
385.2 5,004,466
904 5,004,467

CLASS 606

132 5,004,468
139 5,004,469
188 5,004,470
5,004,471
194 5,004,472
234 5,004,473

CLASS 623

13 5,004,474
23 5,004,475
5,004,476
53 5,004,477

CLASS 800

205 5,004,863
235 5,004,864

CLASS 917

53 5,004,404

CLASSIFICATION OF DESIGNS

D2— 274 315,823
314 315,824
315,828
D3— 30.1 315,829
32 315,825
37 315,826
52 315,830
71 315,827
D4— 104 315,831
138 315,833
D5— 16 315,834
D6— 302 315,835
334 315,836
368 315,837
391 315,838
513 315,839
525 315,840
528 315,841
541 315,842
542 315,843
574 315,844
601 315,845
D7— 335 315,846
393 315,847
608 315,848
672 315,849
679 315,850
315,851
D8— 30 315,852
315,853
66 315,854
68 315,855
98 315,856
308 315,857
315,858
357 315,859
367 315,860
371 315,861
380 315,862
315,863
395 315,864
315,865
D9— 318 315,866
341 315,867
315,868
392 315,869
415 315,871
420 315,870
446 315,872
D10— 62 315,873
114 315,874
D11— 43 315,875
120 315,876
143 315,877
164 315,878
315,879
315,880
315,881
315,882
315,883
D12— 128 315,884
129 315,885
133 315,886
136 315,887
157 315,888
187 315,889
191 315,890
315,891
315 315,892
D13— 165 315,893
171 315,894
179 315,832
D14— 100 315,895
315,896
315,897
107 315,898
109 315,899
114 315,900
116 315,901
121 315,902
315,903
150 315,904
156 315,905
239 315,906
247 315,907
250 315,908
315,909
315,910
D15— 7 315,911
315,912
28 315,913
72 315,914
D16— 202 315,915
218 315,916
D17— 20 315,917
315,918
D18— 13 315,919
19 315,920
22 315,921
D19— 1 315,922
55 315,923
75 315,924
92 315,925
315,926
D20— 4 315,927
17 315,928
D21— 68 315,929
123 315,930
128 315,931
315,932
180 315,933
191 315,934
315,935
315,936
315,937
201 315,938
220 315,939
226 315,940
315,941
232 315,942
254 315,943
D22— 142 315,944
D23— 244 315,945
313 315,948
377 315,946
315,947
393 315,949
D24— 8 315,950
315,951
315,952
10 315,954
315,955
14 315,956
16 315,953
315,957
41 315,958
48 315,959
D25— 138 315,960
D26— 2 315,961
24 315,962
63 315,963
315,964
67 315,965
122 315,966
D28— 35 315,967
315,968
85 315,969
D29— 2 315,970
6 315,971
7 315,972
D30— 122 315,973
131 315,974
D32— 41 315,975
D34— 33 315,976
D99— 1 315,977

CLASSIFICATION OF PLANTS

P.— 9 7,484
36 7,485
68 7,486
76 7,487
77 7,488
80 7,489

STATUTORY INVENTION REGISTRATIONS

2— 414 H902
60— 757 H903
206— 3 H904
244— 3.28 H905
250— 336.1 H908
328— 233 H909
342— 25 H910
403— 409.1 H906
423— 448 H907

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 5,003,716
5,003,764
5,003,844
5,003,883
5,004,309
5,004,587
5,004,894
5,004,976
5,005,099
02 : 5,003,921
04 : 5,003,662
5,003,712
5,003,789
5,004,186
5,004,292
5,004,334
5,004,452
5,004,703
5,004,911
5,004,973
5,005,059
5,005,061
5,005,069
05 : 5,004,228
06 : 5,003,631
5,003,652
5,003,655
5,003,656
5,003,678
5,003,681
5,003,696
5,003,721
5,003,725
5,003,726
5,003,735
5,003,758
5,003,766
5,003,767
5,003,811
5,003,820
5,003,852
5,003,859
5,003,870
5,003,913
5,003,916
5,003,918
5,003,942
5,003,945
5,003,975
5,003,980
5,003,989
5,003,997
5,004,014

5,004,020
5,004,053
5,004,062
5,004,074
5,004,084
5,004,100
5,004,107
5,004,118
5,004,119
5,004,123
5,004,134
5,004,136
5,004,144
5,004,190
5,004,191
5,004,193
5,004,195
5,004,204
5,004,205
5,004,210
5,004,227
5,004,232
5,004,252
5,004,259
5,004,277
5,004,286
5,004,307
5,004,308
5,004,311
5,004,313
5,004,331
5,004,340
5,004,344
5,004,350
5,004,372
5,004,405
5,004,418
5,004,421
5,004,422
5,004,432
5,004,438
5,004,455
5,004,462
5,004,474
5,004,480
5,004,499
5,004,506
5,004,531
5,004,535
5,004,540
5,004,562
5,004,563
5,004,588

5,004,596
5,004,605
5,004,606
5,004,610
5,004,624
5,004,632
5,004,639
5,004,643
5,004, 52
5,004, 88
5,004,690
5,004,692
5,004,696
5,004,697
5,004,698
5,004,699
5,004,804
5,004,806
5,004,870
5,004,877
5,004,883
5,004,914
5,004,923
5,004,957
5,004,962
5,004,963
5,004,969
5,004,971
5,004,986
5,004,993
5,004,999
5,005,000
5,005,009
5,005,011
5,005,018
5,005,063
5,005,089
5,005,095
5,005,096
5,005,101
5,005,118
5,005,120
5,005,148
5,005,155
5,005,157
5,005,160
5,005,176
5,005,180
5,005,189
08 : 5,003,635
5,003,708
5,003,750
5,003,825

5,003,875
5,003,973
5,004,018
5,004,072
5,004,133
5,004,166
5,004,239
5,004,393
5,004,403
5,004,404
5,004,634
5,004,944
5,004,978
5,005,005
5,005,008
5,005,102
5,005,170
5,005,171
09 : 5,003,694
5,003,734
5,003,771
5,003,773
5,003,829
5,003,866
5,003,971
5,004,044
5,004,046
5,004,139
5,004,208
5,004,276
5,004,317
5,004,502
5,004,541
5,004,549
5,004,682
5,004,842
5,004,871
5,004,872
5,004,878
5,005,001
10 : 5,003,701
5,003,763
5,004,034
5,004,035
5,004,036
5,004,590
5,004,638
5,004,693
5,004,714
5,004,749
5,004,784
5,004,834
11 : 5,004,457

12 : 5,003,645
5,003,715
5,003,743
5,003,902
5,003,911
5,003,946
5,004,039
5,004,041
5,004,052
5,004,099
5,004,181
5,004,230
5,004,231
5,004,270
5,004,296
5,004,388
5,004,402
5,004,441
5,004,537
5,004,574
5,004,772
5,004,866
5,004,893
5,005,014
5,005,125
5,005,140
5,005,200
4,349,987
13 : 5,003,648
5,003,676
5,003,695
5,003,963
5,004,067
5,004,263
5,004,279
5,004,390
5,004,539
5,004,607
5,004,875
15 : 5,004,240
16 : 5,004,687
5,004,722
5,005,030
5,005,072
5,005,139
17 : 5,003,664
5,003,666
5,003,679
5,003,733
5,003,772
5,003,784
5,003,823
5,003,857

5,003,879
5,003,960
5,004,073
5,004,081
5,004,124
5,004,146
5,004,219
5,004,229
5,004,258
5,004,297
5,004,319
5,004,427
5,004,445
5,004,533
5,004,536
5,004,570
5,004,642
5,004,709
5,004,786
5,004,828
5,004,830
5,004,853
5,004,859
5,004,947
5,004,955
5,004,959
5,004,994
5,005,048
4,235,553
18 : 5,003,795
5,003,881
5,003,907
5,003,938
5,004,112
5,004,129
5,004,189
5,004,25[illegible]
5,004,293
5,004,488
5,004,509
5,004,577
5,004,910
5,005,123
5,005,201
19 : 5,003,794
5,004,169
5,004,243
5,004,305
5,004,394
5,004,507
5,004,864
5,004,966
20 : 5,004,013

5,004,029
5,004,244
5,004,799
5,004,849
21 : 5,003,802
5,004,302
5,004,850
22 : 5,003,718
5,003,722
5,003,943
5,004,007
5,004,017
5,004,095
5,004,096
5,004,476
5,004,627
5,004,847
5,004,848
5,004,851
23 : 5,004,282
24 : 5,003,687
5,003,739
5,003,779
5,003,862
5,003,876
5,003,982
5,003,988
5,004,131
5,004,237
5,004,241
5,004,251
5,004,583
5,004,615
5,005,017
5,005,019
25 : 5,003,630
5,003,647
5,003,903
5,003,910
5,003,993
5,004,075
5,004,091
5,004,121
5,004,157
5,004,158
5,004,303
5,004,310
5,004,343
5,004,362
5,004,447
5,004,458
5,004,512
5,004,525
5,004,543
5,004,544
5,004,616
5,004,617
5,004,672
5,004,686
5,004,691
5,004,705
5,004,712
5,004,803
5,004,815
5,004,820
5,004,876
5,004,913
5,004,954
5,005,022
5,005,122
5,005,174
5,005,195
5,005,196
26 : 5,003,639
5,003,683
5,003,691
5,003,697
5,003,740
5,003,801
5,003,808
5,003,838
5,003,853
5,003,906
5,003,932
5,003,933
5,003,944
5,003,952
5,003,953

5,004,024
5,004,063
5,004,102
5,004,125
5,004,179
5,004,198
5,004,201
5,004,209
5,004,245
5,004,266
5,004,280
5,004,284
5,004,285
5,004,289
5,004,345
5,004,367
5,004,473
5,004,487
5,004,490
5,004,504
5,004,550
5,004,565
5,004,725
5,004,792
5,004,827
5,004,841
5,004,890
5,004,940
5,005,006
5,005,109
5,005,130
4,459,526
27 : 5,003,949
5,003,992
5,003,994
5,004,011
5,004,111
5,004,202
5,004,351
5,004,369
5,004,593
5,004,630
5,004,961
5,004,972
5,005,004
28 : Re.33,562
29 : 5,003,649
5,003,928
5,004,058
5,004,077
5,004,197
5,004,386
5,004,481
5,004,558
5,004,589
31 : 5,003,865
5,004,355
32 : 5,003,912
5,004,371
33 : 5,003,759
5,003,850
5,004,426
34 : 5,003,637
5,003,658
5,003,864
5,003,908
5,003,920
5,003,962
5,003,965
5,003,972
5,004,321
5,004,325
5,004,366
5,004,433
5,004,442
5,004,470
5,004,471
5,004,534
5,004,579
5,004,595
5,004,613
5,004,618
5,004,710
5,004,739
5,004,740
5,004,762
5,004,788
5,004,790

5,004,791
5,004,796
5,004,798
5,004,810
5,004,852
5,004,862
5,004,896
5,005,074
5,005,082
5,005,167
5,005,168
5,005,175
5,005,212
35 : 5,004,992
36 : 5,003,634
5,003,640
5,003,672
5,003,674
5,003,702
5,003,707
5,003,723
5,003,782
5,003,787
5,003,805
5,003,815
5,003,848
5,003,892
5,003,895
5,003,905
5,003,915
5,003,935
5,003,983
5,004,008
5,004,023
5,004,033
5,004,037
5,004,105
5,004,106
5,004,114
5,004,128
5,004,142
5,004,153
5,004,162
5,004,176
5,004,192
5,004,196
5,004,218
5,004,225
5,004,337
5,004,391
5,004,417
5,004,482
5,004,529
5,004,571
5,004,599
5,004,625
5,004,629
5,004,636
5,004,658
5,004,661
5,004,663
5,004,664
5,004,673
5,004,681
5,004,683
5,004,713
5,004,726
5,004,770
5,004,812
5,004,858
5,004,861
5,004,865
5,004,873
5,004,916
5,005,015
5,005,031
5,005,032
5,005,035
5,005,036
5,005,050
5,005,054
5,005,119
5,005,124
5,005,161
5,005,205
37 : 5,003,661
5,003,930
5,003,970

5,003,978
5,003,995
5,004,025
5,004,079
5,004,132
5,004,141
5,004,430
5,004,434
5,004,724
5,005,111
38 : 5,004,398
39 : Re.33,565
5,003,720
5,003,747
5,003,777
5,003,780
5,003,788
5,003,807
5,003,840
5,003,855
5,003,968
5,004,027
5,004,069
5,004,109
5,004,110
5,004,122
5,004,164
5,004,274
5,004,323
5,004,389
5,004,468
5,004,491
5,004,492
5,004,557
5,004,568
5,004,597
5,004,598
5,004,635
5,004,708
5,004,711
5,004,717
5,004,746
5,004,766
5,004,783
5,004,809
5,004,882
5,004,891
5,004,921
5,004,942
5,005,108
5,005,135
3,870,474
4,392,580
40 : 5,003,642
5,003,690
5,003,719
5,003,774
5,004,005
5,004,016
5,004,042
5,004,182
5,004,269
5,004,353
5,004,400
5,004,551
5,005,100
41 : 5,003,646
5,003,756
5,003,843
5,004,206
5,004,879
5,004,933
5,004,975
5,005,070
42 : 5,003,682
5,003,703
5,003,729
5,003,738
5,003,746
5,003,819
5,003,858
5,003,925
5,004,098
5,004,103
5,004,145
5,004,151
5,004,152
5,004,160

5,004,185
5,004,199
5,004,216
5,004,361
5,004,437
5,004,456
5,004,464
5,004,479
5,004,484
5,004,495
5,004,514
5,004,601
5,004,728
5,004,741
5,004,758
5,004,777
5,004,839
5,004,854
5,004,856
5,004,869
5,004,887
5,004,888
5,004,920
5,004,956
5,004,987
5,005,065
5,005,104
5,005,115
5,005,126
5,005,142
5,005,143
5,005,169
5,005,197
5,005,211
43 : 5,003,821
44 : 5,003,827
5,003,909
5,004,093
5,004,338
5,005,204
45 : 5,003,757
5,004,212
5,004,233
5,004,260
5,004,459
5,004,647
46 : 5,004,500
47 : Re.33,563
5,003,849
5,004,003
5,004,004
5,004,012
5,004,028
5,004,226
5,004,953
5,005,084
48 : 5,003,641
5,003,654
5,003,669
5,003,685
5,003,704
5,003,744
5,003,800
5,003,813
5,003,818
5,003,830
5,003,927
5,003,929
5,003,941
5,003,967
5,003,985
5,003,986
5,004,047
5,004,048
5,004,049
5,004,159
5,004,177
5,004,234
5,004,248
5,004,272
5,004,273
5,004,275
5,004,281
5,004,283
5,004,287
5,004,333
5,004,379
5,004,399

5,004,461
5,004,483
5,004,508
5,004,513
5,004,519
5,004,553
5,004,721
5,004,757
5,004,760
5,004,823
5,004,860
5,004,867
5,004,936
5,005,023
5,005,066
5,005,137
5,005,147
5,005,151
5,005,158
5,005,159
5,005,173
5,005,191
5,005,193
5,005,213
49 : Re.33,564
5,004,057
5,004,472
5,004,505
5,004,811
50 : 5,003,730
51 : 5,003,894
5,003,969
5,003,979
5,004,071
5,004,097
5,004,167
5,004,183
5,004,246
5,004,271
5,004,332
5,004,374
5,004,383
5,004,419
5,004,467
5,004,566
5,004,575
5,004,608
5,004,620
5,004,801
53 : 5,003,727
5,003,753
5,003,826
5,003,833
5,003,845
5,003,890
5,003,940
5,003,998
5,004,257
5,004,373
5,004,387
5,004,633
5,005,145
5,005,210
54 : 5,003,737
5,003,923
5,004,765
5,004,949
55 : 5,003,659
5,003,699
5,003,717
5,003,797
5,003,822
5,003,837
5,003,948
5,004,407
5,004,493
5,004,523
5,004,651
5,004,655
5,004,775
5,004,863
5,004,874
5,004,979
5,004,984
5,005,110
5,005,152
5,005,182

04 :	315,829		315,921		315,927	23 :	315,868	34 :	315,830		315,936
	315,832		315,946		315,938	24 :	315,925		315,840	42 :	315,849
	315,908		315,947	13 :	315,865		315,926		315,859		315,928
	315,909		315,950	15 :	315,933		315,939		315,876		315,945
	315,910		315,957	17 :	315,860		315,951		315,901		315,977
	315,955		315,962		315,870		315,952	36 :	315,916	45 :	315,970
06 :	315,828		315,963		315,878	25 :	315,838		315,940	48 :	315,836
	315,843		315,965		315,879		315,853		315,969		315,845
	315,848		315,971		315,880		315,897	39 :	315,833		315,924
	315,862		315,972		315,881	26 :	315,942		315,837		315,944
	315,867	08 :	315,827		315,882		315,959		315,864		315,966
	315,877	09 :	315,929		315,883	27 :	315,885		315,872	50 :	315,842
	315,884		315,954		315,907		315,941	40 :	315,937	51 :	315,841
	315,894		315,956		315,943		315,974	41 :	315,824		315,922
	315,906		315,967	18 :	315,891	31 :	315,835		315,886	53 :	315,874
	315,917		315,968		315,953	33 :	315,869		315,934		315,892
	315,918	12 :	315,839	20 :	315,958		315,961		315,935	55 :	315,846

PLANT PATENTS

06 :	7,484		7,487		7,488		7,489	41 :	7,485		

STATUTORY INVENTION REGISTRATIONS

06 :	H902	21 :	H906								
17 :	H908	24 :	H905		H910	25 :	H903	34 :	H904	36 :	H909

U.S. GOVERNMENT PRINTING OFFICE : O—1991

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ Domestic; @ $ Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

U.S. DEPARTMENT OF COMMERCE
Robert A. Mosbacher, *Secretary*
PATENT AND TRADEMARK OFFICE
Harry F. Manbeck, Jr., *Commissioner*